

MELSEC QnA Series

Programmable Controller

User's Manual
(Hardware)

Q2A(S1)/Q3A/Q4ACPU

● SAFETY PRECAUTIONS ●

(Read these precautions before using.)

When using Mitsubishi equipment, thoroughly read this manual and the associated manuals introduced in this manual.

Also pay careful attention to safety and handle the module properly.

These ● SAFETY PRECAUTIONS ● classify the safety precautions into two categories: "DANGER" and "CAUTION".




DANGER

Procedures which may lead to a dangerous condition and cause death or serious injury if not carried out properly.



CAUTION

Procedures which may lead to a dangerous condition and cause superficial to medium injury, or physical damage only, if not carried out properly.

Depending on circumstances, procedures indicated by  CAUTION may also be linked to serious results.

In any case, it is important to follow the directions for usage.

Store this manual in a safe place so that you can read it whenever necessary.

Always forward it to the end user.

[DESIGN PRECAUTIONS]



DANGER

- **Install a safety circuit external to the PC that keeps the entire system safe even when there are problems with the external power supply or the PC module. Otherwise, trouble could result from erroneous output or erroneous operation.**
- (1) **Outside the PC, construct mechanical damage preventing interlock circuits such as emergency stop, protective circuits, positioning upper and lower limits switches and interlocking forward /reverse operations.**

[DESIGN PRECAUTIONS]



DANGER

(2) When the PC detects the following problems, it will stop calculation and turn off all output.

- **The power supply module has over current protection equipment and over voltage protection equipment.**
- **The PC CPUs self-diagnostic functions, such as the watchdog timer error, detect problems. In addition, all output will be turned on when there are problems that the PC CPU cannot detect, such as in the I/O controller. Build a fail safe circuit exterior to the PC that will make sure the equipment operates safely at such times. See Section 4.2 of this user's manual for example fail safe circuits.**

See this user's manual for example fail safe circuits.

(3) Output could be left on or off when there is trouble in the outputs module relay or transistor. So build an external monitoring circuit that will monitor any single outputs that could cause serious trouble.

- **Provide external safety circuits such as fuses to prevent smoking or ignition that occurred if an overcurrent higher than the rating or caused by a load short circuit, etc. flows in the output module continuously for a long time.**
 - **Build a circuit that turns on the external power supply when the PC main module power is turned on. If the external power supply is turned on first, it could result in erroneous output or erroneous operation.**
 - **Refer to the manual of each data link for the action state of each station caused by a communication error of the data link.**
- There is a risk of accidents due to erroneous outputs or erroneous operation.**

[DESIGN PRECAUTIONS]



DANGER

- When connecting a peripheral device to the CPU module or a personal computer, etc. to the special function module to perform control (data change) for the operating PLC, configure an interlock circuit in the sequence program to ensure that the whole system will always operate safely.

When performing other control (program change, operating status change (status control)) for the operating PLC, read the manual carefully and ensure safety fully before starting the control.

In the above control performed especially for a remote PLC from an external device, immediate response may not be made to PLC side faults due to a data communication error.

Configure an interlock circuit in the sequence program, and also determine between the external device and PLC CPU the corrective action, etc. to be taken as a system at occurrence of a data communication error.



CAUTION

- Do not bunch the control wires or communication cables with the main circuit or power wires, or install them close to each other. They should be installed 100mm (3.94inch) or more from each other. Not doing so could result in noise that would cause erroneous operation.
- When controlling items like lamp load, heater or solenoid valve using an output module, large current (approximately ten times greater than that present in normal circumstances) may flow when the output is turned OFF→ON. Take measures such as replacing the module with one having sufficient rated current.

[INSTALLATION PRECAUTIONS]



DANGER

- Use the PC in an environment that meets the general specifications contained in this manual. Using this PC in an environment outside the range of the general specifications could result in electric shock, fire, erroneous operation, and damage to or deterioration of the product.
- Install so that the pegs on the bottom of the module fit securely into the base unit peg holes. Not installing the module correctly could result in erroneous operation, damage, or pieces of the product falling.
When installing more cables, be sure that the base unit and the module connectors are installed correctly. After installation, check them for looseness. Poor connections could cause an input or output failure.
- Correctly connect the extension cable securely to the connector of the module mounted on the base unit. After installing, check.
A poor contact could cause an input or output failure.
- Correctly connect the memory card installation connector to the memory card. After installation, be sure that the connection is not loose. A poor connection could cause an operation failure.
- Always mount or dismount the module after switching off all phases of the external power supply.
Not doing so may damage the product.
- Do not directly touch the module's conductive parts or electronic components. Touching the conductive parts could cause an operation failure or give damage to the module.

[WIRING PRECAUTIONS]



DANGER

- Completely turn off the external power supply when installing or placing wiring. Not completely turning off all power could result in electric shock or damage to the product.
- When turning on the power supply or operating the module after installation or wiring work, be sure that the module's terminal covers are correctly attached. Not attaching the terminal cover could result in electric shock.

[WIRING PRECAUTIONS]



CAUTION

- Be sure to ground the FG terminals and LG terminals to the protective ground conductor. Not doing so could result in electric shock or erroneous operation.
- When wiring in the PC, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or damage.
- Do not connect multiple power supply modules in parallel. Doing so could cause overheating, fire or damage to the power supply module. If the terminal screws are too tight, it may cause falling, short circuit or erroneous operation due to damage of the screws or module.
- Crimp or pressure weld the external connection connector with a tool designated by the manufacturer or solder it correctly.
Improper connection could cause a short circuit, fire or erroneous operation.
- Tighten the terminal screws with the specified torque. If the terminal screws are loose, it could result in short circuits, fire, or erroneous operation.
Tightening the terminal screws too far may cause damage to the screws and/or the module, resulting in fallout, short circuits, or malfunction.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fires, damage, or erroneous operation.
- External connections shall be crimped or pressure welded with the specified tools, or correctly soldered. For information regarding the crimping and pressure welding tools, see the I/O module's user's manual. Imperfect connections could result in short circuit, fires, or erroneous operation.

[STARTUP AND MAINTENANCE PRECAUTIONS]

DANGER

- Do not touch the terminals while power is on. Doing so could cause shock or erroneous operation.
- Correctly connect the battery. Also, do not charge, disassemble, heat, place in fire, short circuit, or solder the battery. Mishandling of battery can cause overheating or cracks which could result in injury and fires.
- Switch all phases of the external power supply off when cleaning the module or tightening the terminal screws. Not doing so could result in electric shock.

CAUTION

- The online operations conducted for the CPU module being operated, connecting the peripheral device (especially, when changing data or operation status), shall be conducted after the manual has been carefully read and a sufficient check of safety has been conducted. Operation mistakes could cause damage or problems with the module. Do not disassemble or modify the modules. Doing so could cause trouble, erroneous operation, injury, or fire.
- Switch all phases of the external power supply off before mounting or removing the module. If you do not switch all phases of the external power supply, it will cause failure or malfunction of the module.
- When using a radio communication device such as a cellular phone or Personal Handy Phone system (PHS), use it at least 25cm away from the PLC.
Not doing so can cause a malfunction.
- Always make sure to touch the grounded metal to discharge the electricity charged in the body, etc., before touching the module. Failure to do so may cause a failure or malfunctions of the module.
- Do not drop the battery fitted to the module, and do not give it impact. Doing so may damage the battery, causing battery fluid to leak inside the battery. Do not use the battery that has been dropped or given impact, but dispose of it.
- Before touching the module, be sure to touch a grounded metal or the like to discharge static charge accumulated on your body.
If static charge is not discharged, failure or malfunction of the module will be caused.

[DISPOSAL PRECAUTIONS]

CAUTION

- When disposing of this product, treat it as industrial waste.

REVISIONS

*The manual number is given on the bottom right of the front cover.

| Print Date | *Manual Number | Revision |
|------------|----------------|--|
| Jun., 1996 | IB(NA) 66607-A | First edition |
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| Dec., 2003 | IB(NA) 66607-D | <div>Partial corrections</div> <p>SAFETY PRECAUTIONS, Section 3.1, 3.1.3, 3.1.4, 3.1.5, 6.2</p> |
| | | |

Japanese Manual Version F

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This manual describes the operating precautions, input/output connections, and error codes related to Q2ACPU , Q2ACPU-S1, Q3ACPU, and Q4ACPU (hereafter, all are referred to simply as "QnACPU") operations.

About Manuals :

Other manuals related to QnACPU operation (shown below) are also available if necessary.

Detailed manuals

| Manual Name | Manual No. |
|--|-------------------|
| Q2A(S1)/Q3A/Q4ACPU User's Manual Discusses QnACPU performance, functions, and operation, and contains the specifications for the power supply, memory card, and base unit. (sold separately) | IB-66608 |
| Q2A(S1)/Q3A/Q4ACPU, Q2AS(H)CPU(S1) User's Manual Corresponding Additional Explanation The functions and the instructions added for the version B functions of QnACPU and Q2AS(H) CPU are explained. (sold separately) | IB-66821 |

Related manuals

| Manual Name | Manual No. |
|--|-------------------|
| QnACPU Guidebook This manual is designed for first-time users of the QnACPU. It explains the procedures for all operations from program creation, to program writing to the CPU, and program debugging. It also explains how to use the QnACPU special features. (sold separately) | IB-66606 |
| QnACPU Programming Manual (Fundamentals) This manual explains the programming procedures required for program creation. It also explains the device names, parameters, and program types. (sold separately) | IB-66614 |
| QCPU(Q mode)/QnACPU Programming Manual (Common Instructions) This manual explains how to use the sequence instructions, basic instructions, and application instructions. (sold separately) | SH-080039 |
| QnACPU Programming Manual (Special Function Module) This manual explains the dedicated instructions used with special function modules at the Q2ACPU(S1), Q3ACPU, and Q4ACPU. (sold separately) | IB-66616 |
| QnACPU Programming Manual (AD57 Instructions) This manual explains the dedicated instructions used to operate the AD57(S1) CRT controller module at the Q2ACPU(S1), Q3ACPU, and Q4ACPU. (sold separately) | IB-66617 |
| QCPU(Q mode)/QnACPU Programming Manual (PID Control Instructions) This manual explains the dedicated instructions used to execute PID control at the Q2ACPU(S1), Q3ACPU, and Q4ACPU. (sold separately) | SH-080040 |

| Manual Name | Manual No. |
|---|------------|
| QCPU(Q mode)/QnACPU Programming module (SFC) This manual explains the SW01VD-SAP3 system configuration, performance specifications, functions, programming, debugging, and error codes. (sold separately) | SH-080041 |
| Building-Block Type Input/Output Module User's Manual This manual gives the specifications for building- block type I/O modules. (sold separately) | IB-66140 |

1. SPECIFICATIONS

1.1 SPECIFICATIONS

Table 1.1 General specification

| Item | Specifications | | | | | |
|-------------------------------|--|------------------------------|-------------|---------------------|--------------------|--|
| Ambient operating temperature | 0 to 50 °C | | | | | |
| Ambient storage temperature | −20 to 75 °C | | | | | |
| Ambient operating humidity | 10 to 90 % RH, No-condensing | | | | | |
| Ambient storage humidity | 10 to 90 % RH, No-condensing | | | | | |
| Vibration resistance | Conforming to JIS B 3502, IEC 61131-2 | | Frequency | Acceleration | Amplitude | No. of sweeps |
| | | Under intermittent vibration | 10 to 57Hz | —— | 0.075mm (0.003in.) | 10 times each in X, Y, Z directions (for 80min.) |
| | | | 57 to 150Hz | 9.8m/s ² | —— | |
| | | Under continuous vibration | 10 to 57Hz | —— | 00.35mm (0.001in.) | |
| | | | 57 to 150Hz | 4.9m/s ² | —— | |
| Shock resistance | Conforming to JIS B 3502, IEC 61131-2 (147 m/s ² , 3 times in each of 3 directions X Y Z) | | | | | |
| Operating ambience | No corrosive gases | | | | | |
| Operating elevation *3 | 2000m (6562ft.) max. | | | | | |
| Installation location | Control panel | | | | | |
| Over voltage category *1 | II max. | | | | | |
| Pollution level *2 | 2 max. | | | | | |

- *1 : This indicates the section of the power supply to which the equipment is assumed to be connected between the public electrical power distribution network and the machinery within premises. Category II applies to equipment for which electrical power is supplied from fixed facilities. The surge voltage withstand level for up to the rated voltage of 300 V is 2500 V.
- *2 : This index indicates the degree to which conductive material is generated in terms of the environment in which the equipment is used. Pollution level 2 is when only non-conductive pollution occurs. A temporary conductivity caused by condensing must be expected occasionally.
- *3 : Do not use or store the PC in the environment when the pressure is higher than the atmospheric pressure at sea level. Otherwise, malfunction may result. To use the PC in high-pressure environment, contact your nearest Mitsubishi representative.

2. PERFORMANCE SPECIFICATIONS

2.1 QnACPU Module Performance Specifications

This section gives the Performance specifications of the QnACPU.

Table 2.1 Performance Specifications

| Item | | Model Name | | | | Remark |
|---|--------------------------|--|--------------------|--------------------|--------------------|---|
| | | Q2ACPU | Q2ACPU-S1 | Q3ACPU | Q4ACPU | |
| Control system | | Repeated operation (using stored program) | | | | |
| I/O control method | | Refresh mode | | | | Direct input using device names possible |
| Programming language | | Language dedicated to sequence control | | | | |
| | | Relay symbol language, logic symbolic language, MELSAP-3 (SFC) | | | | |
| Processing speed (sequence instruction) (μs/step) | LD | 0.2 | | 0.15 | 0.075 | |
| | MOV | 0.6 | | 0.45 | 0.225 | |
| Number of instructions | Sequence instructions | 39 | | | | |
| | Basic Instructions | 230 | | | | |
| | Applloation instructions | 321 | | | | |
| | Dedicated instructions | 171 | | | | |
| Constant soan (ms)(program started at fixed time Intervals) | | 5 to 2000 (can be set in 5 ms units) | | | | Set by parameter |
| Memory capacity | | Capacity of the installed memory card (max. 2036 k bytes) | | | | |
| Program capacity | Number of steps (steps) | Max. 28 k | Max. 60 k | Max. 92 k | Max. 124 k | |
| | Number of files (files) | 28 | 60 | 92 | 124 | |
| Number of I/O device points | | 8192 (X/Y0 to 1FFF) | | | | Number of points that can be used in programs |
| Number of I/O points | | 512 (X/Y0 to 1FF) | 1024 (X/Y0 to 3FF) | 2048 (X/Y0 to 7FF) | 4096 (X/Y0 to FFF) | Number of points actually accessible with I/O modules |

Table 2.1 Performance Specifications (Continued)

| Item | Model Name | | | | Remark |
|---|--|-----------|-----------|-----------|---|
| | Q2ACPU | Q2ACPU-S1 | Q3ACPU | Q4ACPU | |
| Clock function | Year, month, date, hour, minute, second, day of week (automatic recognition of leap years) Accuracy -2.3 to +4.4 s (TYP. +1.8 s)/d at 0 °C Accuracy -1.1 to +4.4 s (TYP. +2.2 s)/d at 25°C Accuracy -9.6 to +2.7 s (TYP. -2.4 s)/d at 55 °C | | | | |
| Allowable momentary power interruption time | Depends on the power supply module | | | | |
| Internal current consumption for 5 VDC (A) | 0.3 (0.4) | 0.3 (0.4) | 0.3 (0.4) | 0.6 (0.9) | The numerical value in parentheses represents a function version "B" or later unit. |
| Weight kg | 0.8 | 0.8 | 0.8 | 0.8 | |
| External dimensions mm (inch) | 250(H) (9.84) × 79.5(W) (3.13) × 121(D) (4.76) | | | | |

REMARK

Please check the ratings label of the CPU unit for the function version "B".



❖ 3. EMC DIRECTIVE AND LOW-VOLTAGE INSTRUCTION ❖

3.1 Requirements for Compliance to EMC Directive (89/336/EEC)

Compliance with the EMC directive, one of EU directives, is now compulsory. The EMC directive is a directive requiring measures against "electromagnetic emission" and for "electromagnetic immunity."

Sections 3.1.1 through 3.1.6 describe cautionary items of configuration of mechanical equipment with MELSEC-QnA Series PLCs to meet requirements of EMC directives.

Though we made our best efforts to prepare description based on the requirements of the regulations and standards we have obtained, we do not guarantee that the entire mechanical equipment manufactured according to the description herein complies with the above-mentioned directives. Final judgment of the method for complying with EMC directives and judgment of compliance are up to the manufacturer of the applicable mechanical equipment.

3.1.1 EMC standards

When the PLC is installed following the directions given in this manual its EMC performance is compliant to the following standards and levels as required by the EMC directive.

| Specifications | Test Item | Test Description | Standard Values |
|----------------------|---|---|---|
| EN50081-2: 1995 | EN55011 Radiated noise | Measure the emission released by the product. | 30M-230 M Hz QP : 30dB μ V/m (30m measurement) *1 230M-1000MHz QP : 37dB μ V/m (30m measurement) |
| | EN55011 Conduction noise | Measure the emission released by the product to the power line. | 150k-500kHz QP : 79dB, Mean : 66dB*1 500k-30MHz QP : 73dB, Mean : 60dB |
| prEN50082-2: 1991 | IEC801-2 Static electricity immunity *2 | Immunity test by applying static electricity to the module enclosure. | 4kV contact discharge 8kV air discharge |
| | IEC801-3 Radiated electromagnetic field *2 | Immunity test by applying aradiated electric field to the product. | 10V/m, 27-500MHz |
| | IEC801-4 First transient burst noise | Immunity test by applying burst noise to the power line and signal cable. | 2kV |

| Specifications | Test Item | Test Description | Standard Values |
|------------------|--|--|---|
| EN50082-2 : 1995 | EN61000-4-2 Static electricity immunity *2 | Immunity test by applying static electricity to the module enclosure. | 4kV contact discharge 8kV air discharge |
| | EN61000-4-4 First transient burst noise | Immunity test by applying burst noise to the power line and signal cable., 2kV | 2kV |
| | ENV50140 Radiated electromagnetic field AM modulation *2 | Immunity test by applying aradiated electric field to the product. | 10V/m, 80-1000MHz, 80% AM modulation@1kHz |
| | ENV50204 Radiated electromagnetic field Pulse modulation *2 | Immunity test by applying aradiated electric field to the product. | 10 V/m, 900MHz, 80% AM modulation@1 k Hz |
| | ENV50141 Conduction noise | Immunity test by inducing an electromagnetic field in the power line signal cable. | 10 V/ms, 0.15-80MHZ, 80% AM modulation@1kHz |

(*1) QP: Quasi-peak value, Mean : Average value

(*2) The PLC is an open type device (device installed to another device) and must be installed in a conductive control box.

The tests for the corresponding items were performed while the PLC was installed to inside the control box.

3.1.2 Installation inside the control cabinet

Since the PLC is an open type device (device incorporated into another device), it must be installed in the control cabinet. This has a good effect of not only for assuring safety but also for shielding noise emitted from the PLC, by means of the control cabinet.

(1) Control cabinet

- (a) Use a conductive control cabinet.
- (b) When attaching the control cabinet's top plate or base plate, mask painting and weld so that good surface contact can be made between the cabinet and plate.
- (c) To ensure good electrical contact with the control cabinet, mask the paint on the installation bolts of the inner plate in the control cabinet so that contact between surfaces can be ensured over the widest possible area.

- (d) Earth the control cabinet with a thick wire so that a low impedance connection to ground can be ensured even at high frequencies. (22mm² wire or thicker is recommended.)
- (e) Holes made in the control cabinet must be 10cm (3.94in.) diameter or less. If the holes are 10cm (3.94in.) or larger, radio frequency noise may be emitted.

(2) Connection of power and ground wires

Earthing and power supply wires for the PLC system must be connected as described below.

- (a) Provide an earthing point near the power supply module. Earth the power supply's LG and FG terminals (LG : Line Ground, FG : Frame Ground) with the thickest and shortest wire possible. (The wire length must be 30cm (11.18in.) or shorter.) The LG and FG terminals function is to pass the noise generated in the PC system to the ground, so an impedance that is as low as possible must be ensured. As the wires are used to relieve the noise, the wire itself carries a large noise content and thus short wiring means that the wire is prevented from acting as an antenna.

Note) A long conductor will become a more efficient antenna at high frequency.

- (b) The earth wire led from the earthing point must be twisted with the power supply wires. By twisting with the earthing wire, noise flowing from the power supply wires can be relieved to the earthing. However, if a filter is installed on the power supply wires, the wires and the earthing wire may not need to be twisted.

3.1.3 Cables

The cables led from the control cabinet contain a high frequency noise element and outside the control panel these cables act as antennae and radiate noise. The cables connected to input/output modules or special modules which leave the control panel must always be shielded cables.

Mounting of a ferrite core on the cables is not required (excluding some models) but if a ferrite core is mounted, the noise radiated through the cable can be suppressed further.

Use of a shielded cable is also effective for increasing the noise immunity level.

The PLC system's input/output and special function module provide a noise immunity level of equivalent to that stated in IEC801-4 : 2 k V when a shielded cable is used. If a shielded cable is not used or if the shield earthing treatment is not suitable even when used (See Section 3.1.6), the noise immunity level is less than 2 kV.

Note) prEN50082-2 specifies the noise resistance level based on the signal wire application.

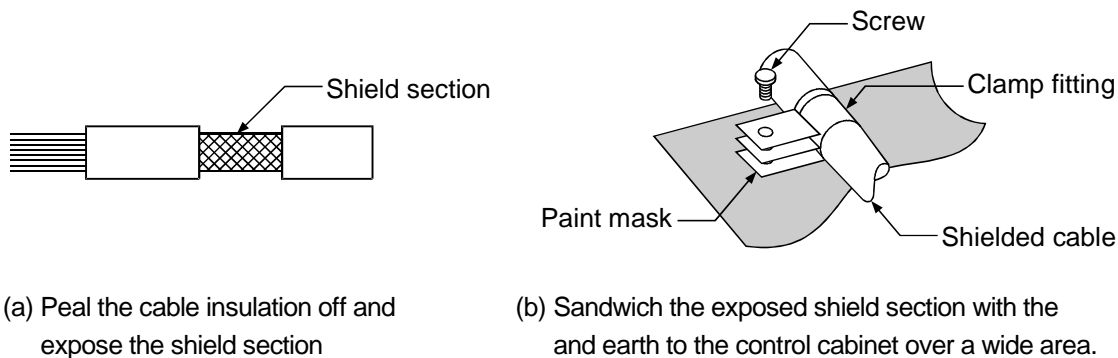
Signals involved in process control : 2kV

Signals not involved in process control : 1kV

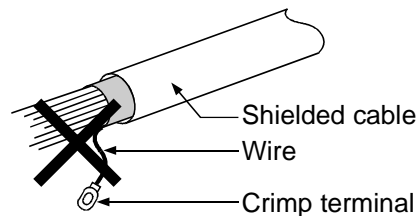
The meaning of "involved in process control" is not defined in prEN50082-2. However, when the purposes of the EMC Directive are considered, the signals that could cause personal injury or risks in the facility if a malfunction occurs should be defined as "signals involved in process control". Thus, it is assumed that a high noise immunity level is required.

(1) Shield earthing

When a shield of the shielded cable is earthed to the cabinet body, please ensure that the shield contact with the body is over a large surface area. If the cabinet body is painted it will be necessary to remove paint from the contact area. All fastenings must be metallic and the shield and earthing contact must be made over the largest available surface area. If the contact surfaces are too uneven for optimal contact to be made either use washers to correct for surface inconsistencies or use an abrasive to level the surfaces. The following diagrams show examples of how to provide good surface contact of shield earthing by use of a cable clamp.



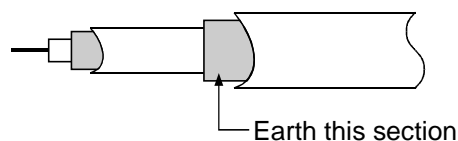
Note) The method of earthing by soldering a wire onto the shield section of the shielded cable as shown below is not recommended. The high frequency impedance will increase and the shield will be ineffective.



(2) MELSECNET/II module, MELSECNET/10 module

- (a) The following requirements apply to AJ71QAR21, AJ71QLR21, AJ71QBR11.

Always use a triaxial cable for the module. The radiated noise in the band of 30 M Hz or higher can be suppressed by using a triax cable. Earth the outer shield by the method described in (1).

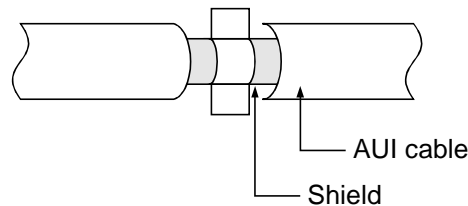


- (b) Always mount a ferrite core onto the triaxial cable. Mount the ferrite core near the control cabinet outlet of each cable. Use of the TDK ZCAT3035 ferrite core is recommended.

(3) Ethernet module

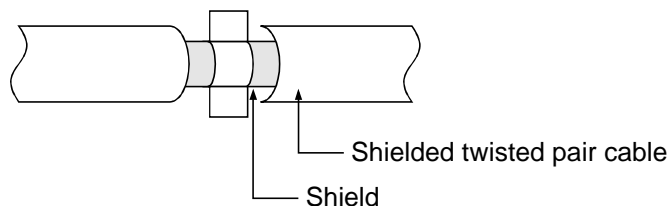
Precautions for the AUI cable, twisted pair cable and coaxial cable are described below.

- (a) Be sure to ground the AUI cable connected to the 10-BASE-5 connector. AUI is a shielded cable. Strip of a part of the sheath as shown in the figure below, and ground the exposed shield in as wide an area as possible.



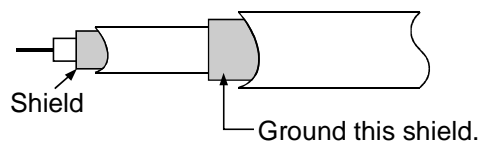
For the shield grounding treatment, refer to (1).

- (b) Use a shielded twisted pair cable for the twisted pair cable connected to the 10-BASE-T connector. Strip of a part of the sheath of the shielded twisted pair cable as shown in the figure below, and ground the exposed shield in as wide an area as possible.



For the shield grounding treatment, refer to (1).

- (c) Be sure to use double shielded coaxial cable for the coaxial cable connected to the 10-BASE-2 connector. Ground the outer shield to ground the double shielded coaxial cable.



For the shield grounding treatment, refer to (1).

| |
|---|
| Ethernet is a registered trademark of XEROX Co., Ltd. in the U.S. |
|---|

- (4) I/O and other communication cables
Always earth the shield section of the I/O signal cables and other communication cables (RS-232-C, RS-422, etc.) in the same manner as described in (1) if the cables go outside of the control cabinet.

(5) Positioning Modules

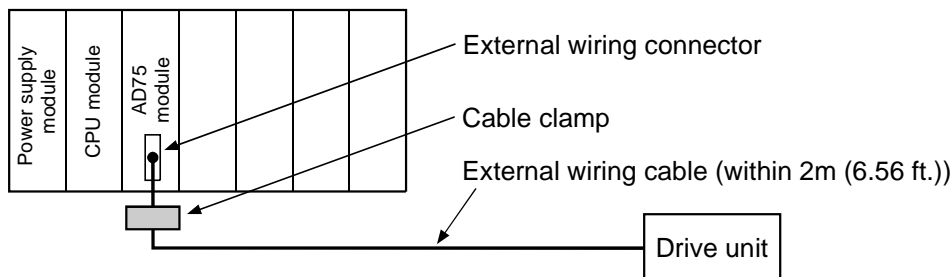
(a) When wiring with a 2m (6.6ft.) or less cable

Ground the shield section of the external wiring cable with the cable clamp.

(Ground the shield at the closest location to the AD75 external wiring connector.)

Wire the external wiring cable to the drive unit and external device with the shortest distance.

Install the drive unit in the same panel.



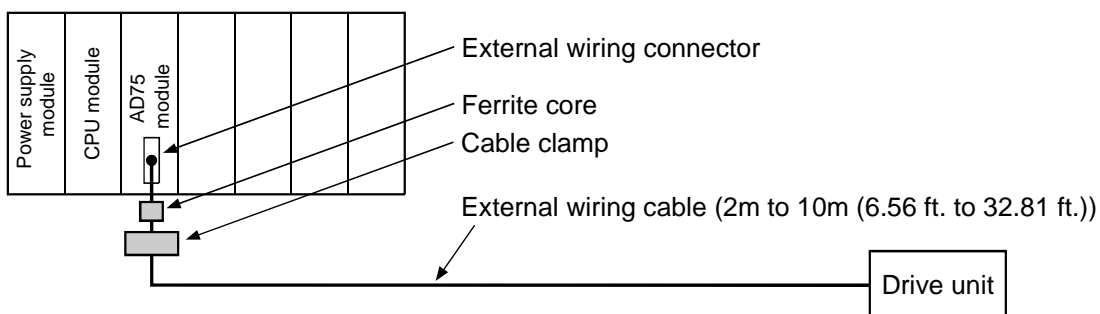
(b) When wiring with cable that exceeds 2m (6.6ft.), but is 10m (32.8ft.) or less

Ground the shield section of the external wiring cable with the cable clamp.

(Ground the shield at the closest location to the AD75 external wiring connector.)

Install a ferrite core.

Wire the external wiring cable to the drive unit and external device with the shortest distance.



(c) Ferrite core and cable clamp types and required quantities

1) Cable clamp

Type : AD75CK (Mitsubishi Electric)

2) Ferrite core

Type : ZCAT3035-1330 (TDK ferrite core)

3) Required quantity

| Cable lenght | Prepared part | Required Qty | | |
|---------------------------------|---------------|--------------|--------|--------|
| | | 1 axis | 2 axis | 2 axis |
| Within 2m (6.6ft.) | AD75CK | 1 | 1 | 1 |
| 2m (6.6ft.) to 10m (32.8ft.) | AD75CK | 1 | 1 | 1 |
| | ZCAT3035-1330 | 1 | 2 | 3 |

3.1.4 Power supply module

The precautions required for each power supply module are described below. Always observe the items noted as precautions.

| Model | Precautions |
|----------------|---|
| A61P, A62P | Not used |
| A63P | Use the 24VDC panel power equipment conforming to the EU Directive. |
| A61PEU, A62PEU | Always ground the LG and FG terminals after short-circuiting them. |

3.1.5 Ferrite core

The ferrite core effectively reduces radiation noise in a band between 30 and 100MHz. Though the ferrite core is not compulsory except for some models, installation of the ferrite core is recommended if the shielding effect of the cable routed outside the panel is insufficient. The ferrite core used for our tests is ZCAT3035 made by TDK.

Install the ferrite core on the cable at a point just inside the panel that is routed outside the panel. An improper installation position will eliminate the effect of the ferrite core.

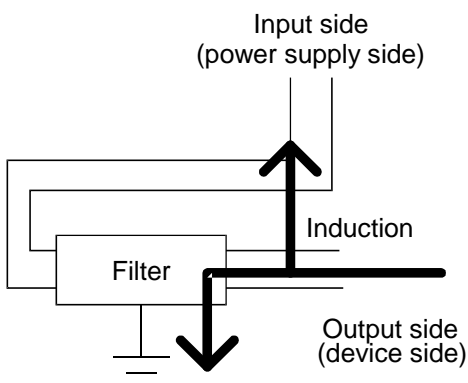
3.1.6 Noise filter (power supply line filter)

The noise filter (power supply line filter) is a device effective to reduce conducted noise. Except some particular models described in Section 3.1.3 (5), installation of a noise filter onto the power supply lines is not necessary. However conducted noise can be reduced if it is installed. (The noise filter is generally effective for reducing conducted noise in the band of 10 M Hz or less.) Usage of the following filters is recommended.

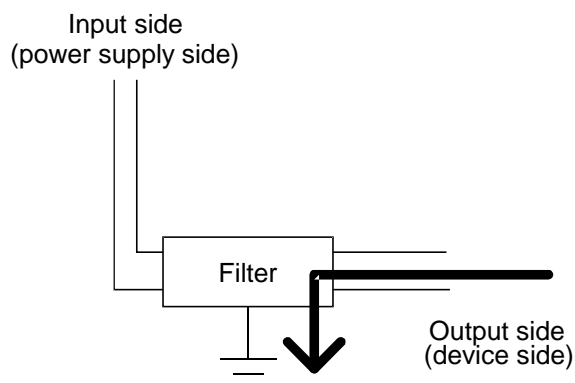
| Model name | FN343-3/01 | FN660-6/06 | ZHC2203-11 |
|---------------|------------|------------|------------|
| Manufacturer | SCHAFFNER | SCHAFFNER | TDK |
| Rated current | 3A | 6A | 3A |
| Rated voltage | 250V | | |

The precautions required when installing a noise filter are described below.

- (1) Do not bundle the wires on the input side and output side of the noise filter.
When bundled, the output side noise will be induced into the input side wires from which the noise was filtered.



(a) The noise will be included when the input and output wires are bundled.



(b) Separate and lay the input and output wires.

- (2) Earth the noise filter earthing terminal to the control cabinet with the shortest wire possible (approx. 10cm (3.94in.)).

3.2 Requirement to Conform to the Low-Voltage Instruction

The low-voltage instruction, one of the European Instructions, is now regulated. The low-voltage instruction require each device which operates with power supply ranging from 50 V AC to 1000 V and 75 V DC to 1500 V to satisfy necessary safety items.

In the Sections from 3.2.1 to 3.2.7, cautions on installation and wiring of the MELSEC-QnA series PC to conform to The Low Voltage Directive requires are described.

We have put the maximum effort to develop this material based on the requirements and standards of the regulation that we have collected. However, compatibility of the devices which are fabricated according to the contents of this manual to the above regulation is not guaranteed. Each manufacturer who fabricates such device should make the final judgement about the application method of the low-voltage instruction and the product compatibility.

3.2.1 Standard applied for MELSEC-QnA

The standard applied for MELSEC-QnA is EN61010-1 safety of devices used in measurement rooms, control rooms, or laboratories.

For the modules which operate with the rated voltage of 50VAC/75VDC or above, we have developed new models that conform to the above standard.

For the modules which operate with the rated voltage under 50VAC/75VDC, the conventional models can be used, because they are out of the Low Voltage Directive application range.

3.2.2 Precautions when using the QnA series

Module selection

(1) Power module

For a power module with rated input voltage of 100/200VAC, select a model in which the internal part between the first order and second order is intensively insulated, because it generates hazardous voltage (voltage of 42.4V or more at the peak) area.

For a power module with 24VDC rated input, a conventional model can be used.

(2) I/O module

For I/O module with rated input voltage of 100/200VAC, select a model in which the internal area between the first order and second order is intensively insulated, because it has hazardous voltage area.

For I/O module with 24VDC rated input, a conventional model can be used.

- (3) CPU module, memory cassette, base unit
Conventional models can be used for these modules, because they only have a 5VDC circuit inside.
- (4) Special module
Conventional models can be used for the special modules including analog module, network module, and positioning module, because the rated voltage is 24VDC or less.
- (5) Display device
Use an A900 series GOT CE compatible model.

3.2.3 Power supply

The insulation specification of the power module was designed assuming installation category II. Be sure to use the installation category II power supply to the PC.

The installation category indicates the durability level against surge voltage generated by lightning strike. Category I has the lowest durability; category IV has the highest durability.

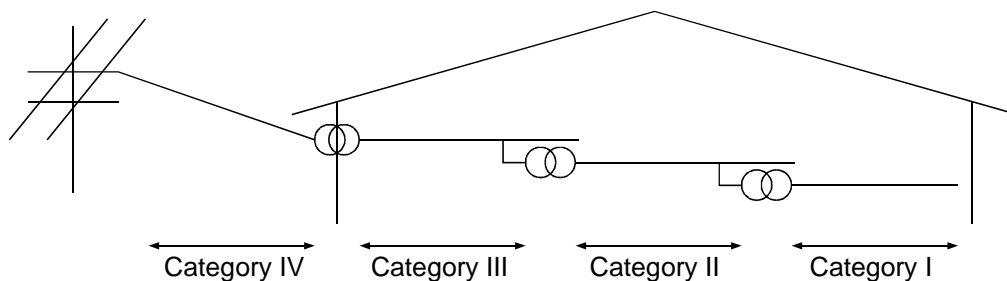


Figure 1. : Installation Category

Category II indicates a power supply whose voltage has been reduced by two or more levels of isolating transformers from the public power distribution.

3.2.4 Control box

Because the PLC is an open device (a device designed to be stored within another module), be sure to use it after storing in the control box.

(1) Electrical shock prevention

In order to prevent persons who are not familiar with the electric facility such as the operators from electric shocks, the control box must have the following functions :

- (a) The control box must be equipped with a lock so that only the personnel who has studied about the electric facility and have enough knowledge can open it.
- (b) The control box must have a structure which automatically stops the power supply when the box is opened.

(2) Dustproof and waterproof features

The control box also has the dustproof and waterproof functions. Insufficient dustproof and waterproof features lower the insulation withstand voltage, resulting in insulation destruction. The insulation in our PLC is designed to cope with the pollution level 2, so use in an environment with pollution level 2 or below.

Pollution level 1 : An environment where the air is dry and conductive dust does not exist.

Pollution level 2 : An environment where conductive dust does not usually exist, but occasional temporary conductivity occurs due to the accumulated dust. Generally, this is the level for inside the control box equivalent to IP54 in a control room or on the floor of a typical factory.

Pollution level 3 : An environment where conductive dust exists and conductivity may be generated due to the accumulated dust.

An environment for a typical factory floor.

Pollution level 4 : Continuous conductivity may occur due to rain, snow, etc. An outdoor environment.

As shown above, the PC can realize the pollution level 2 when stored in a control cabinet equivalent to IP54.

3.2.5 Module installation

(1) Installing modules contiguously


In A series PCs, the left side of each I/O module is left open. When installing an I/O module to the base, do not make any open slots between any two modules. If there is an open slot on the left side of a module with 100/200VAC rating, the printed board which contains the hazardous voltage circuit becomes bare. When it is unavoidable to leave an open slot, be sure to install the blank module (AG60).

When using the A5□B expansion base with no power supply, attach the cover packaged with the expansion base to the side of the leftmost module.

3.2.6 Grounding

There are two kinds of grounding terminals as shown below. Either grounding terminal must be used grounded.

Be sure to ground the protective grounding for the safety reasons.

Protective grounding  : Maintains the safety of the PC and improves the noise resistance.

Functional grounding : Improves the noise resistance.

3.2.7 External wiring

(1) 24VDC external power supply

For special modules that require a 24 V DC I/O module or external power supply, use a model whose 24 V DC circuit is intensively insulated from the hazardous voltage circuit.

(2) External devices

When a device with a hazardous voltage circuit is externally connected to the PLC, use a model whose circuit section of the interface to the PLC is intensively insulated from the hazardous voltage circuit.

(3) Insulation requirements

Voltages are shown in Table 2.

Table 2 : Intensive Insulation Withstand Voltage
(Installation Category II, source : IEC664)

| Rated voltage of hazardous voltage area | Surge withstand voltage (1.2/50μs) |
|---|------------------------------------|
| 150VAC or below | 2500V |
| 300VAC or below | 4000V |

❖ 4. LOADING AND INSTALLATION ❖

4.1 Installing modules

4.1.1 Precautions for handling of modules

This section describes the precautions that must be taken when handling the CPU, I/O modules, special function modules, power supply module, base units, etc.

- (1) Module enclosure, memory cassette, terminal block connectors and pin connectors are made of resin; do not drop them or subject them to strong impact.
- (2) Do not remove modules' printed circuit boards from the plastic casing.
- (3) During wiring, take care to ensure that wiring off cuts, etc. do not get inside the case.
If anything does get inside the case, remove it.
- (4) Tighten the module mounting (unnecessary in normal operating condition) and terminal block screws as indicated below.

| Screw | Tightening Torque N · cm |
|--|--------------------------|
| Module mounting screws (M4 screw) (optional) | 78 to 118 |
| Terminal block screws | 98 to 137 |

- (5) To install a module, push it firmly into the base unit so that the latch engages properly. To remove a module, press the latch to disengage it from the base unit, then pull the module out (for details, refer to the relevant PC CPU User's Manual).

4.1.2 Installation environment

The CPU system should not be installed under the following environmental conditions:

- (1) Places where ambient temperature is outside of 0 to 55°C range.
- (2) Places where ambient humidity is outside of 10 to 90%RH range.

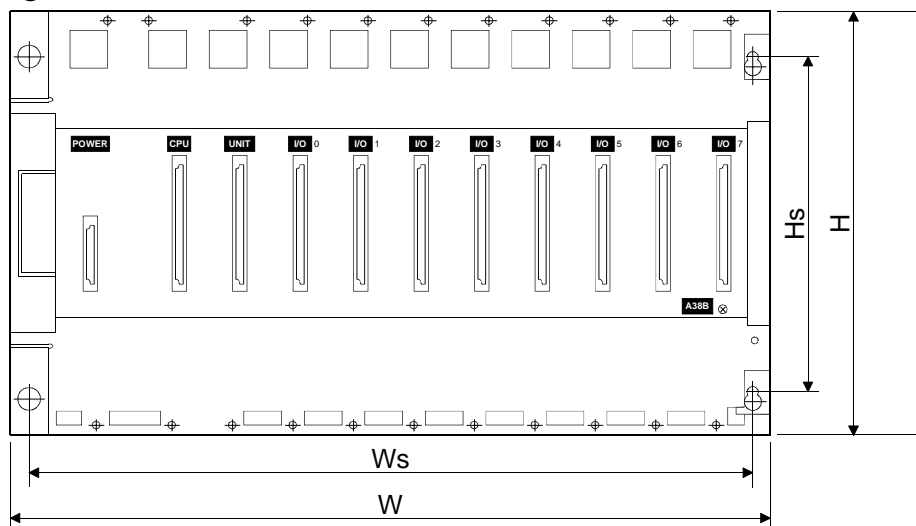
- (3) Places where dewing (condensation) occurs due to sudden temperature changes.
- (4) Places where corrosive or inflammable gas exists.
- (5) Places where a large amount of dust, iron powder and other conductive powder, oil mist, salt or organic solvent exists.
- (6) places exposed to direct sunlight.
- (7) Places where a strong electric or magnetic field exists.
- (8) Places where mechanical vibrations or impacts are transmitted directly to the module body.

4.1.3 Precautions relating to the installation of the unit.

The following precautions must be observed when installing a PC to an operation panel or other bases considering fully the operability, maintainability, and resistance to the environment.

(1) Mounting dimension

Mounting dimensions of each base unit are as follows.

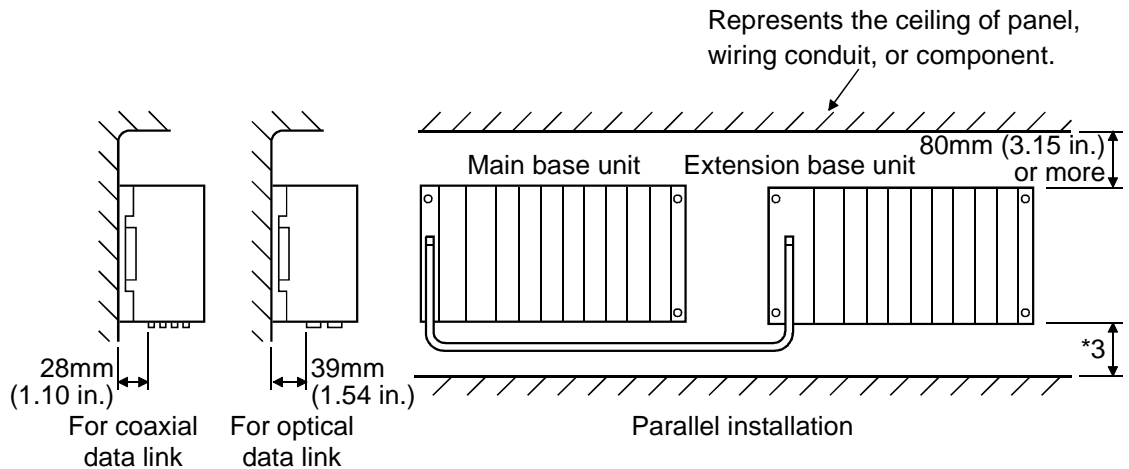


| | A32B | A32B-S1 | A35B | A38B A38HB | A62B | A65B | A68B | A52B | A55B | A58B |
|----|---------------|----------------|----------------|----------------|---------------|----------------|----------------|---------------|----------------|----------------|
| W | 247 (9.72) | 268 (10.55) | 382 (15.03) | 480 (18.9) | 238 (9.37) | 352 (13.86) | 466 (18.35) | 183 (7.2) | 297 (11.69) | 411 (16.18) |
| Ws | 227 (8.93) | 248 (9.76) | 362 (14.25) | 460 (18.11) | 218 (8.58) | 332 (13.07) | 446 (17.6) | 163 (6.42) | 277 (10.9) | 391 (15.4) |
| H | 250 (9.84) | | | | | | | | | |
| Hs | 200 (7.87) | | | | | | | | | |

Dimensions: mm (inch)

(2) Unit mounting position

To ensure proper ventilation and make module replacement easy, provide a clearance of 80 mm (3.15 in.) or more between the top of the unit and any surrounding structure or equipment.



(3) A wiring conduit should be provided if required.

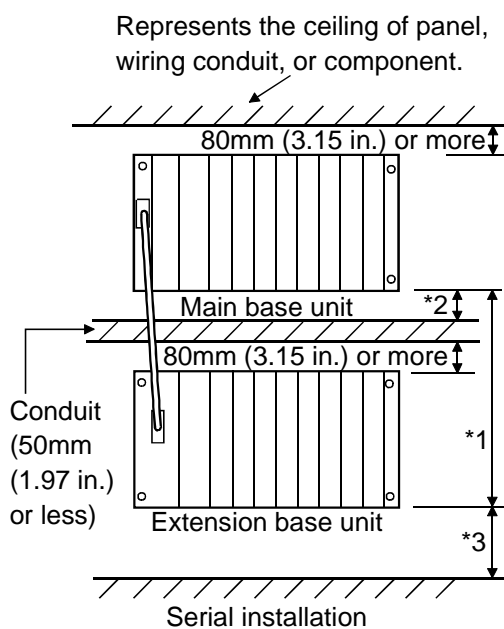
If its clearance above or below the programmable controller is less than indicated in the figure above, observe the following points:

- (a) If the wiring conduit is installed above the programmable controller, its height must be no greater than 50 mm (1.97 in.) to ensure good ventilation.

In addition, there should be adequate space between the programmable controller and the wiring conduit to allow module latches to be pressed.

It will not be possible to replace modules if their latches cannot be pressed.

- (b) If the wiring conduit is installed below the programmable controller, it should be installed so as to allow connection of the optical fiber cable or coaxial cable, taking the minimum bending radius of the cable into consideration.



*1: These dimensions vary depending on the length of the extension cable as follows:

AC06B cable 450mm (17.71 in.) or less
 AC12B cable 1050mm (41.34 in.) or less
 AC30B cable 2850mm (112.20 in.) or less

*2: When a link module is

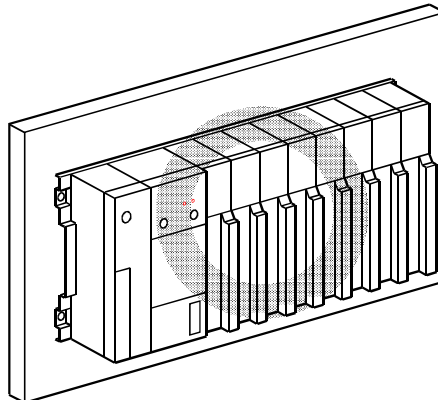
not used 50mm (1.97 in.) or more
 When using $\phi 4.5\text{mm}$ optical fiber cable, or coaxial cable 100mm (3.94 in.) or more
 When using $\phi 8.5\text{mm}$ optical fiber cable 130mm (5.12 in.) or more

*3: When a link module is

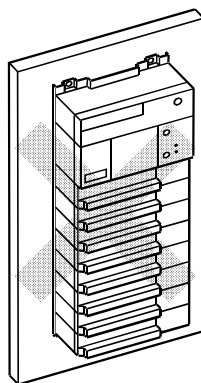
not used 50mm (1.97 in.) or more
 When using $\phi 4.5\text{mm}$ optical fiber cable, or coaxial cable 100mm (3.94 in.) or more
 When using $\phi 8.5\text{mm}$ optical fiber cable 130mm (5.12 in.) or more

(4) Unit mounting orientation

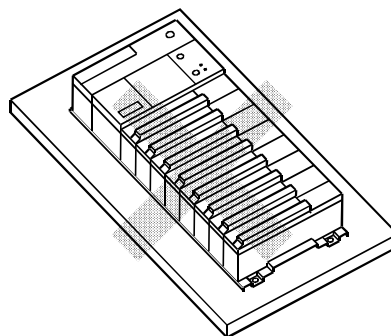
(a) Since the PC generates heat, mount it in a well-ventilated location and in the orientation shown below.



(b) Do not mount it in either of the orientations shown below.



Vertical

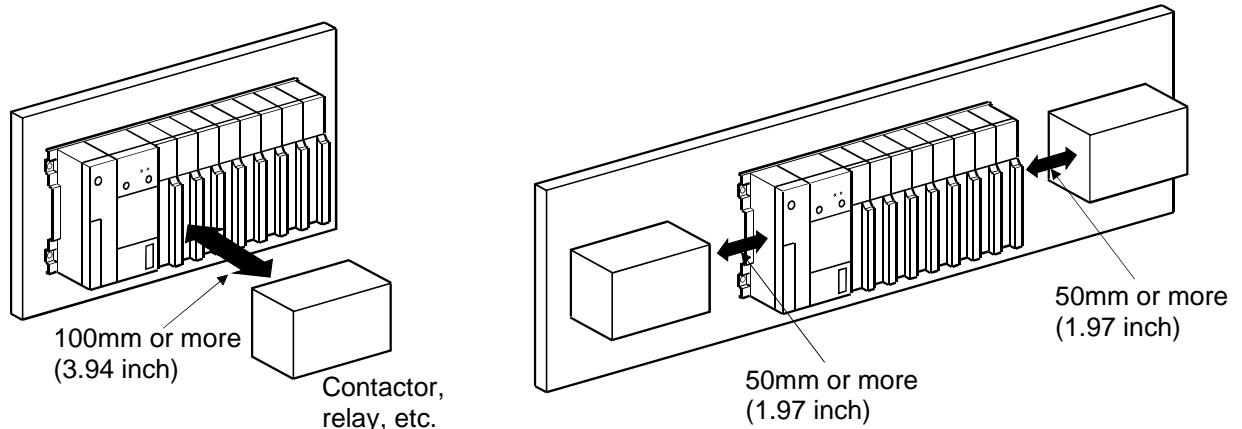


Flat

(5) Mount base unit on a flat surface.

If the mounting surface is uneven, this may strain the printed circuit boards and cause malfunctions.

- (6) Avoid mounting the base unit in proximity to vibration sources such as large magnetic contractors and no-fuse circuit breakers; mount these on a separate panel or at a distance.
- (7) In order to avoid the effects of radiated noise and heat, provide the clearances indicated below between the PC and devices that generate noise or heat (contactors and relays).
- Required clearance in front of..... 100mm or more (3.94inch)
 - Required clearance on the right and left of 50mm or more (1.97inch)



4.2 The view of a fail-safe circuit

When the programmable controller is switched ON/OFF, the outputs may temporarily be incorrect due to the delay time and difference between the start-up time of the programmable controller's power supply and that of the external power supply for process control (especially if it is DC).

For example, if the power to the PC is turned ON after turning ON the external power supply used for the process control with the DC output module, the DC output module may make an erroneous output for an instant.

There is a possibility of abnormal operation if the external power supply is abnormal or a programmable controller fault occurs.

To prevent the abnormal operation of the whole system, machine breakdown, and accidents, build a fail-safe circuit (emergency stop, protective circuit, interlocking circuit, etc.) outside the PC.

An example system design circuit is shown on the following page.



DANGER ●

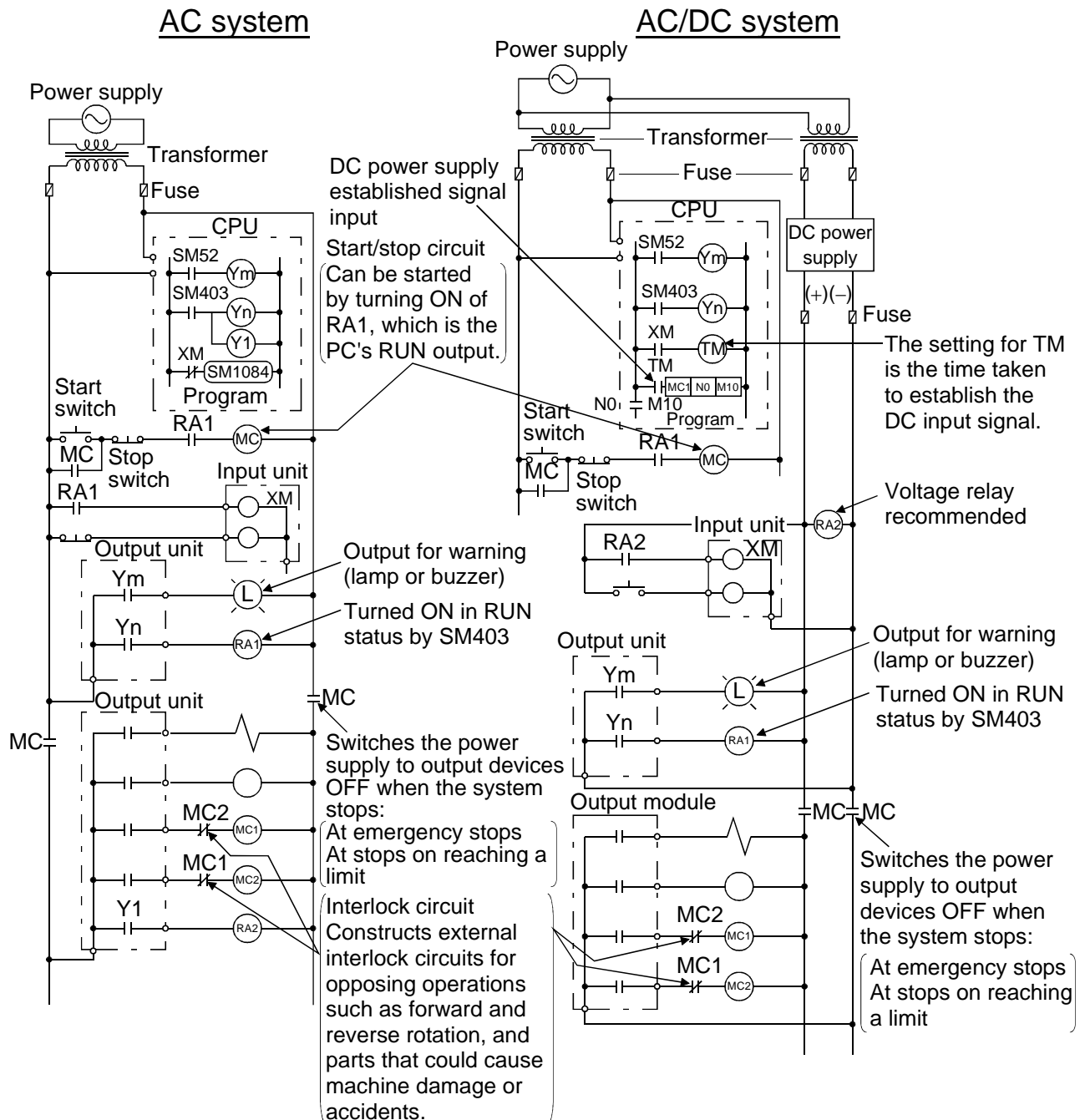
Install a safety circuit external to the PC that keeps the entire system safe even when there are problems with the external power supply or the PC module. Otherwise, trouble could result from erroneous output or erroneous operation.

- (1) Outside the PC, construct mechanical damage preventing interlock circuits such as emergency stop, protective circuits, positioning upper and lower limits switches and interlocking forward /reverse operations.
- (2) When the PC detects the following problems, it will stop calculation and turn off all output.
 - The power supply module has over current protection equipment and over voltage protection equipment.
 - The PC CPUs self-diagnostic functions, such as the watchdog timer error, detect problems. In addition, all output will be turned on when there are problems that the PC CPU cannot detect, such as in the I/O controller. Build a fail safe circuit exterior to the PC that will make sure the equipment operates safely at such times. See Section 4.2 of this user's manual for example fail safe circuits.

See this user's manual for example fail safe circuits.

- (3) Output could be left on or off when there is trouble in the outputs module relay or transistor. So build an external monitoring circuit that will monitor any single outputs that could cause serious trouble.
- Build a circuit that turns on the external power supply when the PC main module power is turned on. If the external power supply is turned on first, it could result in erroneous output or erroneous operation.

(1) System design circuit example



The procedures used to switch on the power supply are indicated below.

- #### AC system
- [1] Switch the power supply ON.
 - [2] Set the CPU to RUN.
 - [3] Switch the start switch ON.
 - [4] The output devices are driven in accordance with program when the magnetic contactor (MC) comes ON.

- #### AC/DC system
- [1] Switch the power supply ON.
 - [2] Set the CPU to RUN.
 - [3] Switch RA2 ON when the DC power supply starts.
 - [4] Switch the timer (TM) ON when the DC power supply reaches working voltage. (The set value for TM must be the time it takes for 100% establishment of the DC power after RA2 is switched ON. Make this set value 0.5 seconds.)
 - [5] Switch the start switch ON.
 - [6] The output devices are driven in accordance with the program when the magnetic contactor (MC) comes ON. (If a voltage relay is used at RA2, no timer (TM) is necessary in the program.)

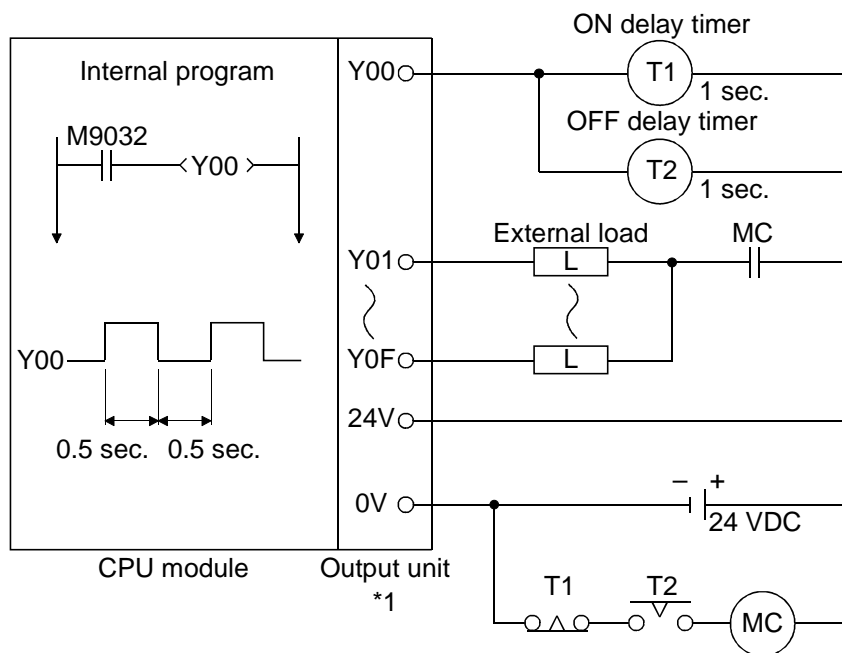
(2) Fail-safe measures to cover the possibility of PC failure

Problems with a CPU memory can be detected by the self diagnosis function. However, problems with I/O control area may not be detected by the CPU.

In such cases, all I/O points turn ON or OFF depending on a condition of problem, and normal operating conditions and operating safety cannot sometimes be maintained.

Though Mitsubishi PCs are manufactured under strict quality control, they may cause failure or abnormal operations due to unspecified reasons. To prevent abnormal operations of whole system, machine breakdown, and accidents, build a fail-safe circuit outside the PC.

The following gives an example of a fail-safe circuit



*1 Since Y00 alternates between ON and OFF at 0.5 second intervals, use a contactless output module (in the above example this is a transistor).

4.3 Power supply connection

4.3.1 Performance Specifications for Power Supply Modules

(1) Normal power supply module

Table 4.1 Power Supply Module Specifications

| Item | | Specifications | | | | | | |
|----------------------------------|--------|---|--------------------|--|--|--------------------|----------------------------|----------------------------------|
| | | A61P | | A62P | A63P | A65P | A66P | A67P |
| Base unit loading position | | Power supply module loading slot | | | | | I/O module loading slot | Power supply module loading slot |
| Input voltage | | 100-120 VAC +10% -15% (85 to 132 VAC) | | 24VDC +30% -35% (15.6 to 31.2 VDC) | 100-120 VAC +10% -15% (85 to 132 VAC) | | 110 VDC (85 to 140 VDC) | |
| | | 200-240 VAC +10 % -15 % (170 to 264 VAC) | | | 200-240 VAC +10 % -15 % (170 to 264 VAC) | | | |
| Input frequency | | 50/60 Hz ±5 % | | — | 50/60 Hz ±5 % | | — | |
| Input voltage distortion factor. | | Within 5% (See Section 4.4) | | | | | | |
| Max. input apparent power | | 110 VA | | 65 W | 110 VA | 95 VA | 65 W | |
| Inrush current | | 20 A, within 8 ms | | 100 A, within 1 ms | 20 A, within 8 ms | | | |
| Rated output current | 5 VDC | 8 A | 5 A | 8 A | 2 A | — | 8 A | |
| | 24 VDC | — | 0.8 A | — | 1.5 A | 1.2 A | — | |
| *1 Overcurrent protection | 5 VDC | 8.8 A or higher | 5.5 A or higher | 8.5 A or higher | 2.2 A or higher | — | 8.5 A or higher | |
| | 24 VDC | — | 1.2 A or higher | — | 2.3 A or higher | 1.7 A or higher | — | |
| *2 Overvoltage protection | 5 VDC | 5.5 to 6.5 V | 5.5 to 6.5 V | 5.5 to 6.5 V | 5.5 to 6.5 V | — | 5.5 to 6.5 V | |
| | 24 VDC | — | | | | | | |
| Efficiency | | 65 % or higher | | | | | | |
| Withstanding voltage | | 1500 VAC for 1 minute between all AC external terminals together and ground 500 VAC for 1 minute between all DC external terminals together and ground | | | | | | |
| Noise durability | | Noise voltage 1500 V.P.P. | | Noise voltage 500 V.P.P. | Noise voltage 1500 V.P.P. | | Noise voltage 500 V.P.P. | |
| Insulation resistance | | 10 M Ω or higher, measured with a 500 VDC insulation resistance tester | | | | | | |
| Power indicator | | Power LED display | | | | | | |
| Terminal screw size | | M4 × 0.7 × 6 | | | | M3 × 0.5 × 6 | M4 × 0.7 × 6 | |

Table 4.1 Power Supply Module Specifications

| Item | Specifications | | | | | |
|--|---|------|---------------|----------------|---|---|
| | A61P | A62P | A63P | A65P | A66P | A67P |
| Applicable wire size | 0.75 to 2 mm ² | | | | | |
| Applicable solderless terminal | V1.25-4, V1.25-YS4A, V2-S4, V2-YS4A | | | | V1.25-3, V1.25-YS3A, V2-S3, V2-YS3A | V1.25-4, V1.25-YS4A, V2-S4, V2-YS4A |
| Applicable tightening torque: N · cm | 118 | | | | 69 | 118 |
| External dimensions mm (inch) | 250 (H) × 55 (W) × 121 (D) (9.8 × 2.1 × 4.7) | | | | 250 (H) × 37.5 (W) × 121 (D) (9.8 × 1.5 × 4.7) | 250 (H) × 55 (W) × 121 (D) (9.8 × 2.1 × 4.7) |
| Weight kg | 0.98 | 0.94 | 0.8 | 0.94 | 0.75 | 0.8 |
| Allowable momentary power interruption time *3 | Less than 20ms | | Less than 1ms | Less than 20ms | — | Less than 20ms (at 100 VDC) |

REMARK

The A66P module has the number of occupied slots shown below. 1 slot

(2) Power supply module for CE marking

Table 4.2 Power Supply Module Specifications

| Item | | Specifications | |
|--|--------|---|-----------------|
| | | A61PEU | A62PEU |
| Base unit loading position | | Power supply module loading slot | |
| Input voltage | | 100-120 / 200-240 VAC $\begin{matrix} +10\% \\ -15\% \end{matrix}$ (85 to 264 VAC) | |
| Input frequency | | 50/60 Hz $\pm 5\%$ | |
| Input voltage distortion factor. | | Within 5% (See Section 4.4) | |
| Max. input apparent power | | 130 VA | 155 VA |
| Inrush current | | 20 A, within 8 ms | |
| Rated output current | 5 VDC | 8 A | 5 A |
| | 24 VDC | — | 0.8 A |
| Overcurrent protection *1 | 5 VDC | 8.8 A or higher | 5.5 A or higher |
| | 24 VDC | — | 1.2 A or higher |
| Overvoltage protection *2 | 5 VDC | 5.5 to 6.5 V | — |
| | 24 VDC | — | — |
| Efficiency | | 65 % or higher | |
| Withstanding voltage | | 1500 VAC for 1 minute between all AC external terminals together and ground 500 VAC for 1 minute between all DC external terminals together and ground | |
| Noise durability | | Noise voltage IEC801-4; 2kV, 1500 V.p.p | |
| Insulation resistance | | 10 M Ω or higher, measured with a 500 VDC insulation resistance tester | |
| Power indicator | | Power LED display | |
| Terminal screw size | | M4 \times 0.7 \times 6 | |
| Applicable wire size | | 0.75 to 2 mm ² | |
| Applicable solderless terminal | | V1.25-4, V1.25-YS4A, V2-S4, V2-YS4A | |
| Applicable tightening torque | | 118 N \cdot cm | |
| External dimensions mm (inch) | | 250 (H) \times 55 (W) \times 121 (D) (9.8 \times 2.1 \times 4.7) | |
| Weight kg | | 0.8 | 0.9 |
| Allowable momentary power interruption time *3 | | Less than 20ms | |

POINTS

*1 : Overcurrent protection

- (a) The overcurrent protection device shuts off the 5VDC, 24VDC ladder and stops the system if the current flowing in the ladder exceeds the specified value.

When this device is activated, the power supply module LED is switched off or dimly lit.

- (b) If this happens, eliminate the cause of the overcurrent — for example insufficient current capacity or short ladder — then start up the system.

When the current has returned to normal, the system undergoes an initial start.

*2 : Overvoltage protection

The overvoltage protection device shuts off the 5VDC ladder and stops the system if an excessive voltage in the range 5.5 to 6.5V is applied to this ladder.

When this device is activated, the power supply module LED is switched off. If this happens, switch the input power OFF, then back ON to restart the system.

If the system is not booted and the LED remains off, the power supply module must be changed.

*3 : Allowable momentary power interruption time

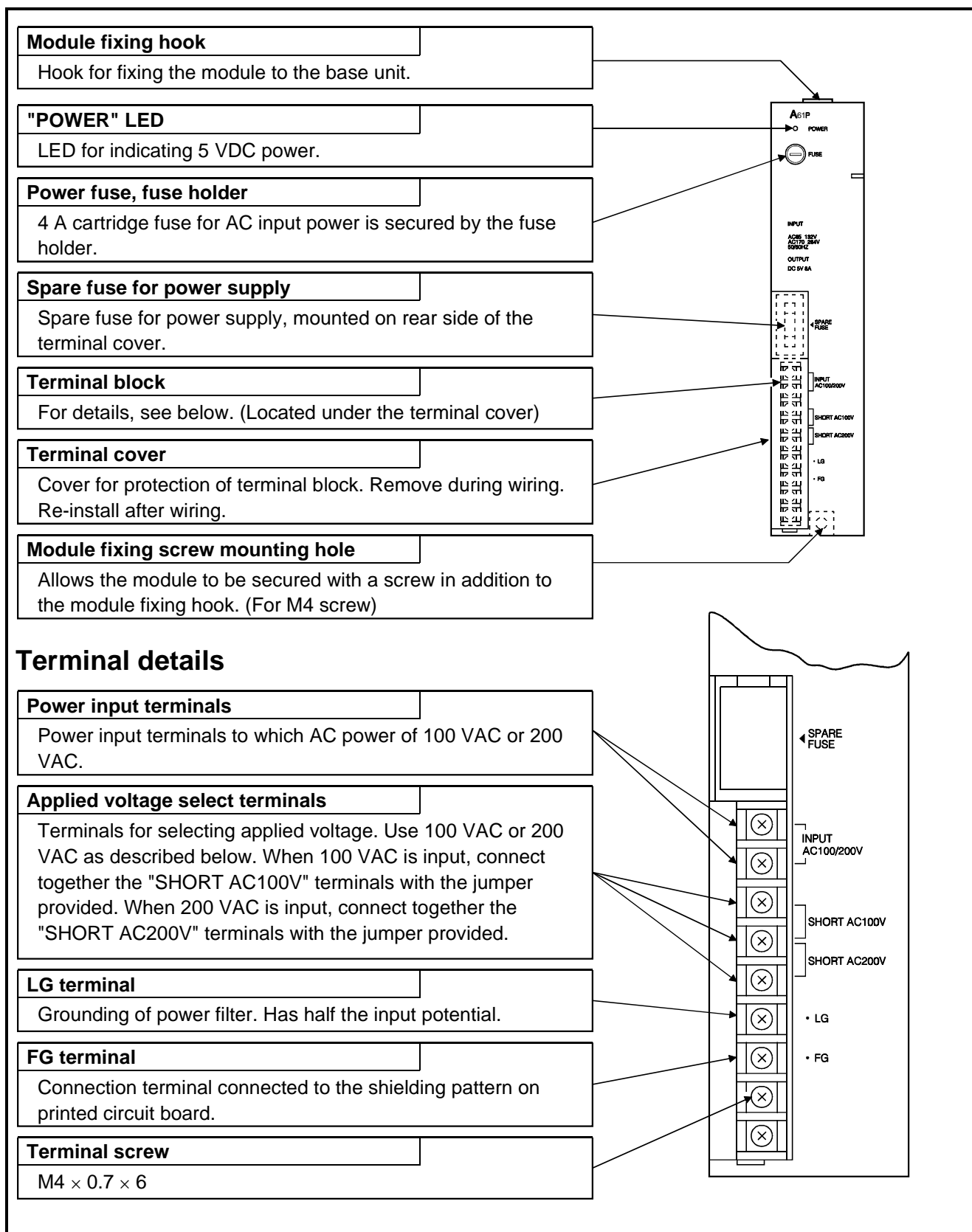
The PC CPU allowable momentary power interruption time varies according to the type of power supply module.

In the case of the A63P module, the allowable momentary power interruption time is defined as from when the 24VDC stabilized primary supply is cut off until the 24VDC voltage drops to the defined voltage (15.6VDC).

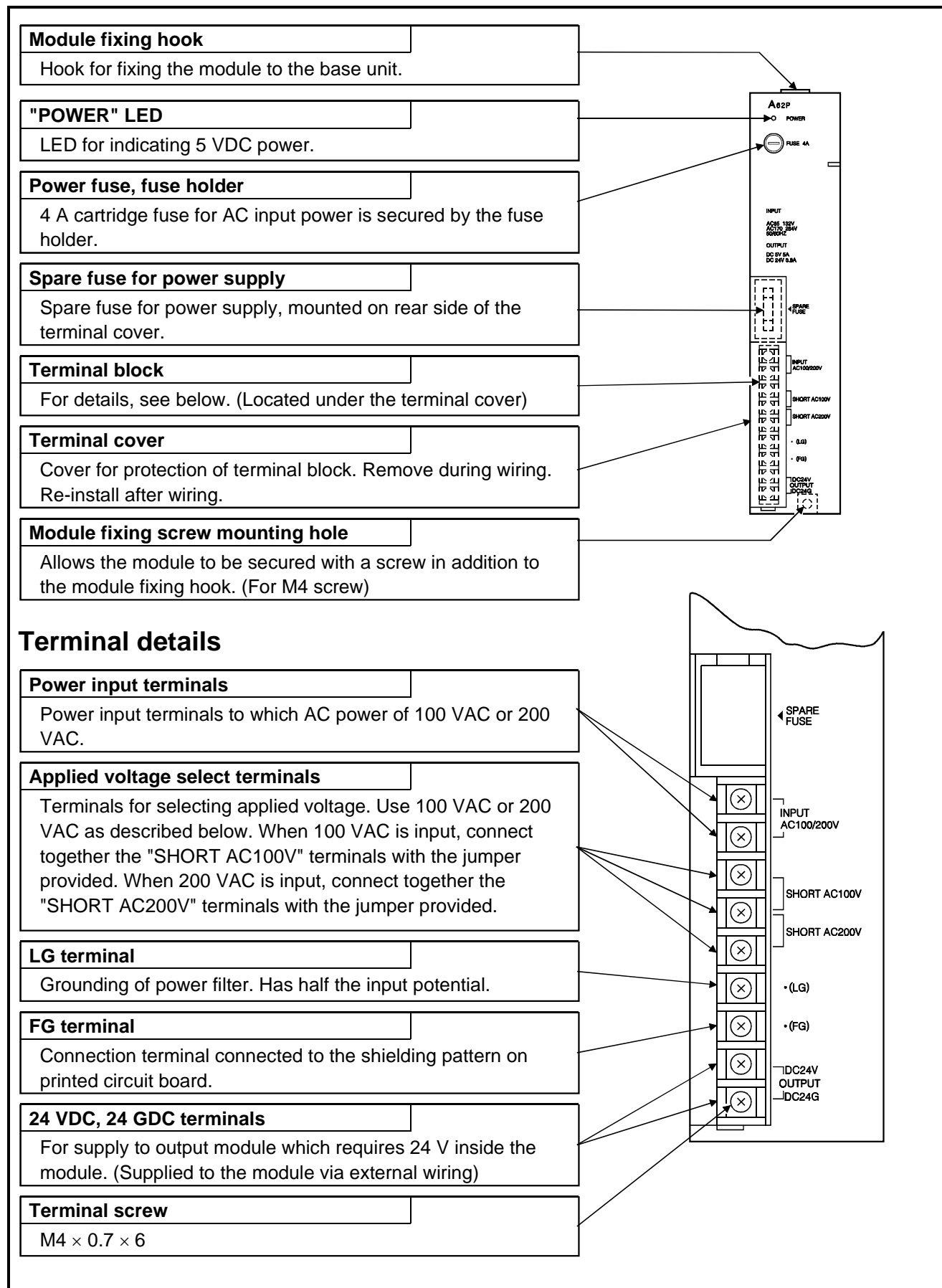
4.3.2 Part identification and setting of Power Supply Module

The names and descriptions of each of the parts of the power supply modules are given below.

(1) Names and description of parts of the A61P, A61PEU module



(2) Names and description of parts of the A62P, A62PEU and A65P modules



(3) Names and description of parts of the A63P and A67P modules

Module fixing hook

Hook for fixing the module to the base unit.

"POWER" LED

LED for indicating 5 VDC power.

Power fuse, fuse holder

Cartridge fuse for DC input power is fixed by the fuse holder. The rating for the fuses are as follows.

A63P: 6.3 A (SM6.3 A)

A67P: 4 A (GTH4)

Spare fuse for power supply

Spare fuse for power supply, mounted on rear side of the terminal cover.

Terminal block

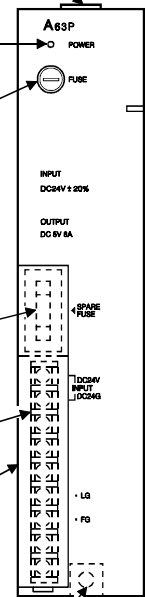
For details, see below. (Located under the terminal cover)

Terminal cover

Cover for protection of terminal block. Remove during wiring. Re-install after wiring.

Module fixing screw mounting hole

Allows the module to be secured with a screw in addition to the module fixing hook. (For M4 screw)



Terminal details

Power input terminals

Power input terminals for A63P: 24 VDC, A67P: 100 VDC. The power fuse will be blown if the 24 VDC connection is made with the wrong polarity.

LG terminal

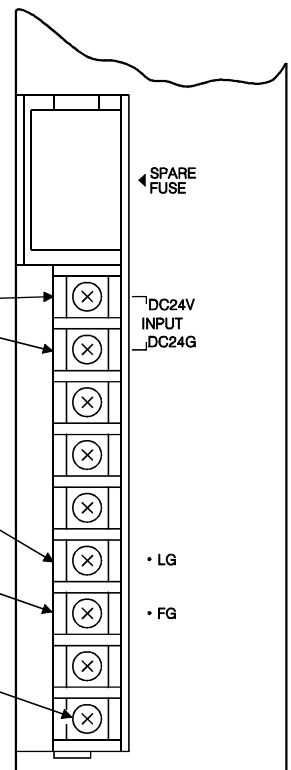
Grounding of power filter.

FG terminal

Connection terminal connected to the shielding pattern on printed circuit board.

Terminal screw

M4 × 0.7 × 6



(4) Names and description of parts of the A66P module

Module fixing hook

Hook for fixing the module to the base unit.

"POWER" LED

LED for indicating 5 VDC power.

Power fuse, fuse holder

4 A cartridge fuse for AC input power is secured by the fuse holder.

Terminal block fixing screw

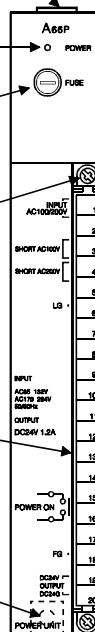
Screw for installing and fixing the terminal block to the module.

Terminal block

For details, see below. (Located under the terminal cover)

Module fixing screw mounting hole

Allows the module to be secured with a screw in addition to the module fixing hook. (For M4 screw)



Terminal details

Power input terminals

Power input terminals to which AC power of 100 VAC or 200 VAC.

Applied voltage select terminals

Terminals for selecting applied voltage. Use 100 VAC or 200 VAC as described below. When 100 VAC is input, connect together the "SHORT AC100V" terminals with the jumper provided. When 200 VAC is input, connect together the "SHORT AC200V" terminals with the jumper provided.

LG terminal

Grounding of power filter. Has half the input potential.

Power ON terminal

Contact terminal which conducts if the 24 VDC output is normal when power input turns on.

FG terminal

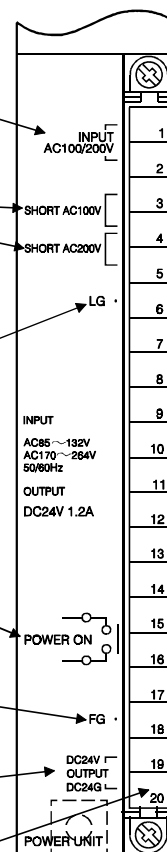
Connection terminal connected to the shielding pattern on printed circuit board.

24 VDC, 24 GDC terminals

For supply to output module which requires 24 V inside the module. (Supplied to the module via external wiring)

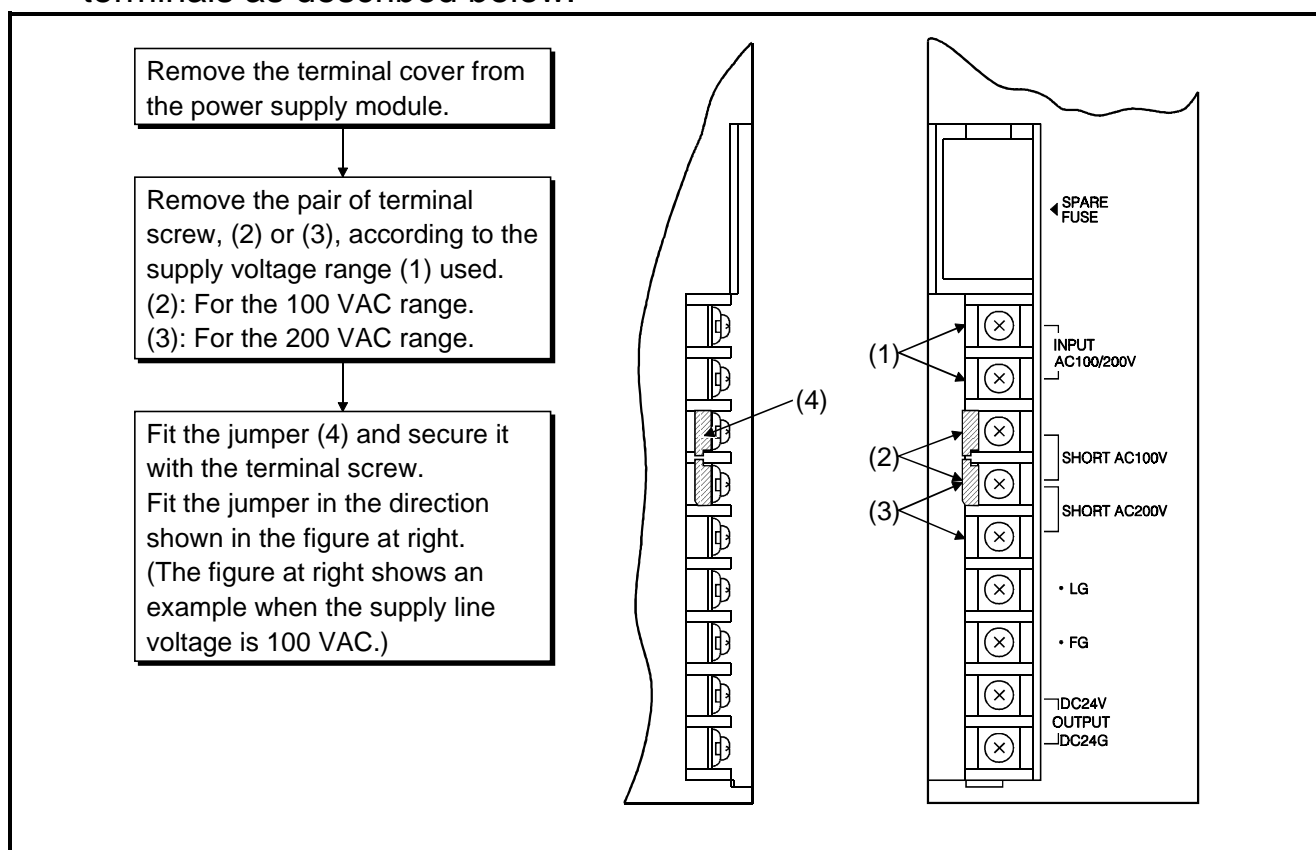
Terminal screw

M3 × 0.5 × 6



(5) Setting

For A61P(EU), A62P(EU), A65P or A66P, the input voltage range, 100V or 200V, must be specified by placing a jumper (supplied) across two terminals as described below:



POINT

If the setting differs from the supply line voltage, the following occurs: do not mis-set.

| | Supply Line Voltage | |
|--|--|--|
| | 100VAC | 200VAC |
| Setting to 100VAC (jumper fitted as indicated at (2)) | — | The power supply module is damaged. (The CPU is not damaged.) |
| Setting to 200VAC (jumper fitted as indicated at (3)) | No error occurs in the module. However, the CPU does not operate. | — |
| No setting (jumper not fitted) | No error occurs in the module. However, the CPU does not operate. | |

4.3.3 Power Supply Connection



DANGER

- Completely turn off the external power supply when installing or placing wiring. Not completely turning off all power could result in electric shock or damage to the product.
- When turning on the power supply or operating the module after installation or wiring work, be sure that the module's terminal covers are correctly attached. Not attaching the terminal cover could result in electric shock.

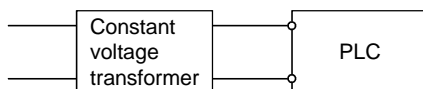


CAUTION

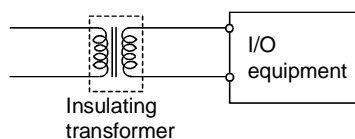
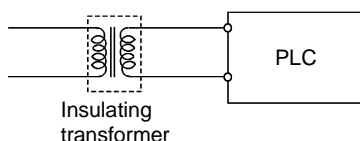
- When wiring in the PC, be sure that it is done correctly by checking the product's rated voltage and the terminal layout. Connecting a power supply that is different from the rating or incorrectly wiring the product could result in fire or damage.
- Tighten the terminal screws with the specified torque. If the terminal screws are loose, it could result in short circuits, fire, or erroneous operation.
Tightening the terminal screws too far may cause damage to the screws and/or the module, resulting in fallout, short circuits, or malfunction.
- Be sure there are no foreign substances such as sawdust or wiring debris inside the module. Such debris could cause fires, damage, or erroneous operation.
- External connections shall be crimped or pressure welded with the specified tools, or correctly soldered. For information regarding the crimping and pressure welding tools, see the I/O module's user's manual. Imperfect connections could result in short circuit, fires, or erroneous operation.

Instructions for wiring the power supply cable and I/O cable.

- (1) When voltage fluctuations are larger than the specified value, connect a constant-voltage transformer.



- (2) Use a power supply which generates minimal noise between wires and between the PLC and ground. If excessive noise is generated, connect an insulating transformer.



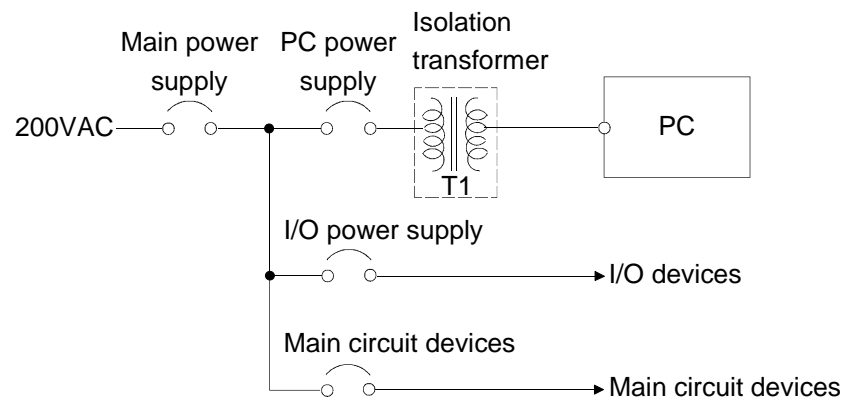
- (3) When a power transformer or insulating transformer is employed to reduce the voltage from 200 VAC to 100 VAC, use one with a capacity greater than those indicated in the following table.

| Power Supply Module | Transformer Capacity |
|---------------------|----------------------|
| A61P, A61PEU | 110VA × n |
| A62P, A62PEU | 110VA × n |
| A65P | 110VA × n |
| A66P | 95VA × n |

n: Stands for the number of power supply modules.

- (4) Provide separate wiring systems for the PC power, I/O devices, and operating devices as shown below.

If the wiring is influenced by excessive noise, connect an isolation transformer.

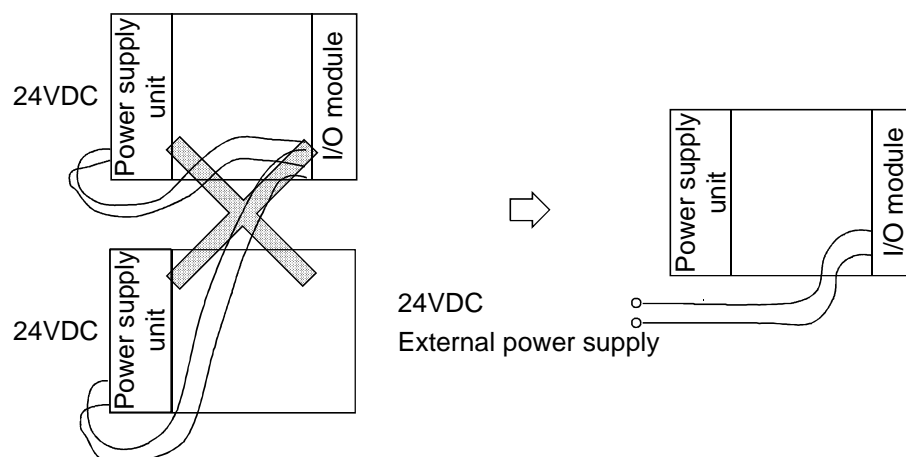


- (5) Note on using the 24 VDC output of the A62P, A65P and A66P power supply module.

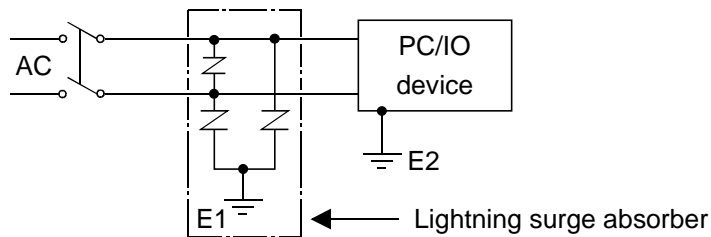
CAUTION

- Do not connect multiple power supply modules in parallel. Doing so could cause overheating, fire or damage to the power supply module. If the terminal screws are too tight, it may cause falling, short circuit or erroneous operation due to damage of the screws or module.

If the 24 VDC output capacity is insufficient for one power supply module, supply 24 VDC from the external 24 VDC power supply as shown below:



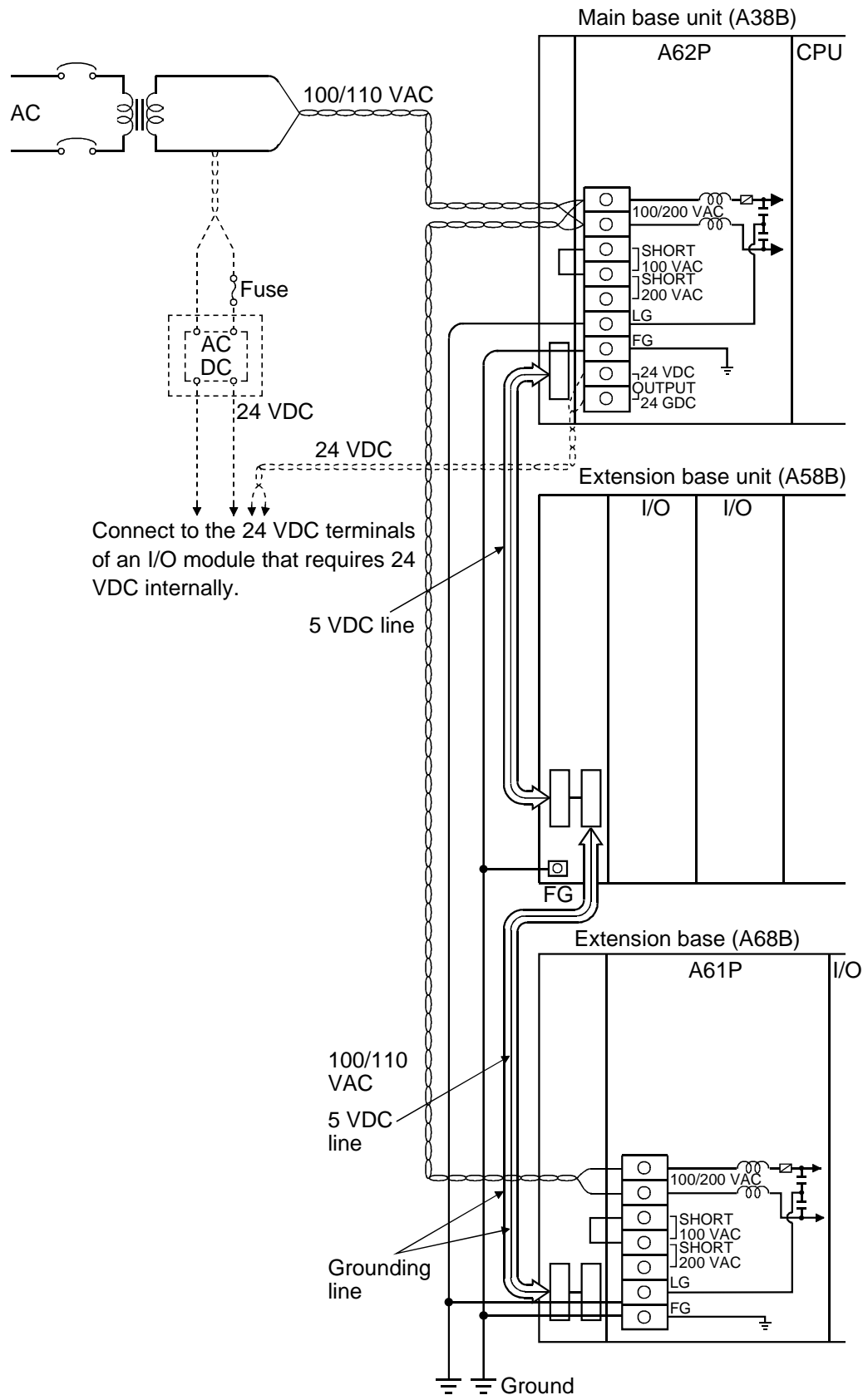
- (6) 100VAC, 200VAC, and 24VDC wires should be twisted as tightly as possible, and connect the modules at the shortest distance between them. To minimize voltage drop, use thick wires (MAX. 2mm²) where possible.
- (7) Do not bind 100VAC and 24VDC wires together with main circuit (high tension and large current) wires or I/O signal wires nor place them near each other. Provide 100mm (3.94 inch) clearance between the wires if possible.
- (8) As a measure against surges caused by lightning, insert a lightning surge absorber as shown below.



| |
|---------------|
| POINTS |
|---------------|

- | |
|--|
| <ol style="list-style-type: none"> (1) Provide separate grounding for the lightning surge absorber (E1) and the PC (E2). (2) Select a lightning surge absorber whose maximum allowable circuit voltage is higher than the circuit voltage at the maximum power supply voltage. |
|--|

- (9) The following is an example of wiring of power supply and grounding wires to main base unit and extension base units.



| |
|---------------|
| POINTS |
|---------------|

- (1) Use thick wires (MAX. 2mm²) where possible for the 100/200VAC and 24VDC power supply, and twist the wires from connected terminals. When a solderless terminal is used, use a solderless terminal with an insulation sleeve to prevent short-circuit if the terminal screw becomes loose.
- (2) When the LG and FG terminals are connected, they must be grounded. If LG terminals and FG terminals are connected without grounding the wires, the PLC may be susceptible to noise. Be aware not to touch the LG terminal since it has potential of half the input voltage.

4.4 Precaution when Connecting the Uninterruptive Power Supply (UPS)

Be sure of the following items when connecting the QnACPU system to the uninterruptive power supply (abbreviated as UPS hereafter) :

Use a UPS which employs the constant inverter power supply method with 5% or less voltage fluctuation.

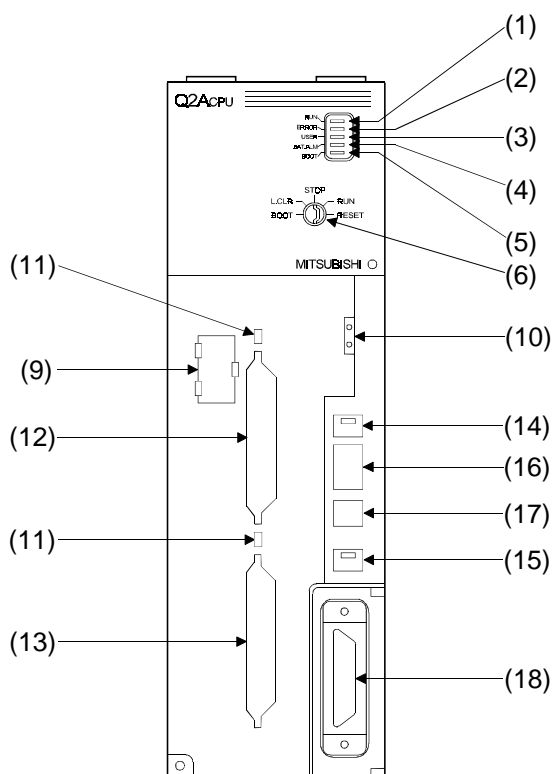
Do not use a UPS with the constant commercial power supply method.

4.5 Nomenclature and Settings

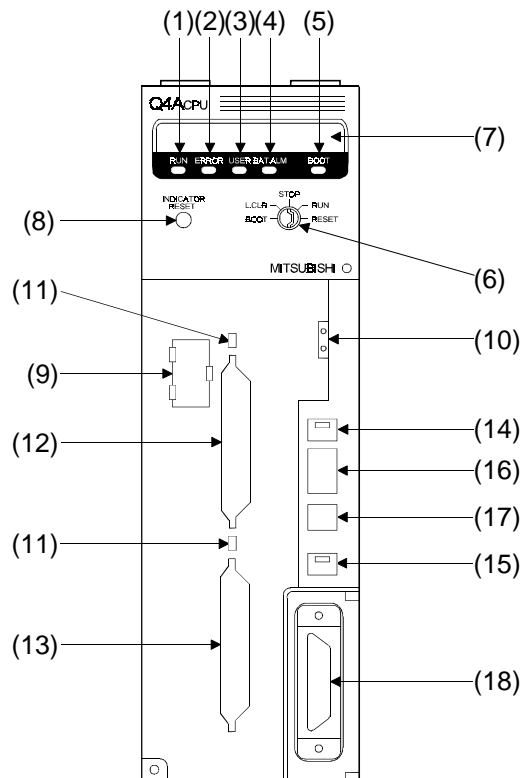
4.5.1 Nomenclature and settings

The programmable controller nomenclature and settings are explained in this section.

(1) Q2ACPU, Q2ACPU-S1





(2) Q3ACPU, Q4ACPU



Appearance with front cover open

| No. | Name | Function |
|-----|-----------|---|
| (1) | RUN LED | <p>Indicates the CPU module operating Status.</p> <p>Lamp ON :When RUN/STOP key switch is set to RUN or STEP-RUN, and operation is in progress.</p> <p>Lamp OFF :When RUN/STOP key switch is set to STOP, PAUSE or STEP-RUN and operation is stopped. Or, when an error that stops operation has been detected.</p> <p>Lamp flashing :When a program is written during STOP and the RUN/STOP key switch is moved from "STOP" to "RUN". The CPU module is not in the RUN status. To put the CPU module in the RUN status, move the RUN/STOP key switch from "RUN" to "STOP" to "RUN" again. Alternatively, perform reset operation with the RUN/STOP key switch. (The Q3ACPU or Q4ACPU shows the "PRG. CHECK!!" message on the display.)</p> |
| (2) | ERROR LED | <p>Lamp ON :When a self-diagnosis error (excluding battery error) which does not stop operation has been detected. (When a "continue operation at error detection" parameter setting has been designated.)</p> <p>Lamp OFF :Normal</p> <p>Lamp flashing :When an error that stops operation has been detected.</p> |

| No. | Name | Function |
|------|---|--|
| (3) | USER LED | Lamp ON :An error has been detected by the CHK instruction, or an annunciator F has come ON. (With Q3ACPU or Q4ACPU, a message or the comment for the annunciator is displayed on the LED indicator.) Lamp OFF :Normal Lamp flashing :Flashing when latch clear is performed. (With Q3ACPU or Q4ACPU, the message "L. CLR RDY" is displayed on the LED indicator.) |
| (4) | BAT.ALARM LED | Lamp ON :When a battery error is activated by a low voltage condition at the CPU module and memory card battery. Lamp OFF :Normal |
| (5) | BOOT LED | Lamp ON :When boot operation is completed. Lamp OFF :When boot operation is not being executed. |
| (6) | RUN/STOP key switch | RUN/STOP :Sequence program operation EXECUTE/STOP. L.CLR :Sets all data in the latch area (designated by parameter) to "OFF" or "0". Also clears sampling trace and status latch registrations. RESET :Executes a hardware reset for operation error, and to initialize operation, etc. |
| (7) | LED display (Q3A and Q4ACPU only) | 16-character display Display content includes comments for self-diagnosis errors, comments for LED display instructions, clock data for SET SM212, and annunciator F-No. comments for SET F,etc. |
| (8) | Display RESET switch (Q3A and Q4ACPU only) | Clears the LED display content, displays the next data (when next data exists). |
| (9) | Battery (A6BAT) | Battery for internal memory and power failure backup. |
| (10) | Battery connector pin | For battery's lead wire connection. (To prevent wasted battery power consumption, the lead wire is disconnected from the connector when shipped from the factory.) |
| (11) | Memory card EJECT button | Ejects the memory card from the CPU module. |
| (12) | Memory card "A" installation connector | Connectors for installing memory cards in the CPU module. |
| (13) | Memory card "B" installation connector | |
| (14) | Memory card "A" in/out (with built in LED)  ON | This switch setting determines whether or not the memory card can be inserted and ejected while power is ON. Factory set to OFF. ON :Insertion/ejection prohibited (LED is ON) OFF :Insertion/ejection permitted (LED is OFF) |
| (15) | Memory card "B" in/out switch (with built in LED)  ON | |

| No. | Name | Function | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|------|---|--|-----|--------------|---------------|---------------|---------------|---------------|------------------------------------|------------------------------------|-----|-----|-----|-----|-----|----|-----|----|-----|-----|-----|-----|----|----|-----|-----|-----|-----|-----|-----|----|
| (16) | <div>Ejects the memory card from the CPU</div> <div><div>→ ON</div><div><div><div></div></div>1</div><div><div><div></div></div>2</div><div><div><div></div></div>3</div><div><div><div></div></div>4</div><div><div><div></div></div>5</div></div> | Designates settings required for CPU module operation. All switches are factory set to OFF. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | SW1 :Boot setting. Designates the memory used for operation. ON :Boot operation OFF :Boot operation is not performed. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | SW2 to SW4 : Parameter area. These switches designate the memory where parameters are stored. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | <table><tr><td rowspan="2"></td><td rowspan="2">Internal RAM</td><td colspan="2">Memory card A</td><td colspan="2">Memory card B</td><td rowspan="6">*SW2 to 4 are valid if SW1 is OFF.</td></tr><tr><td>RAM</td><td>ROM</td><td>RAM</td><td>ROM</td></tr><tr><td>SW2</td><td>OFF</td><td>ON</td><td>OFF</td><td>ON</td><td>OFF</td></tr><tr><td>SW3</td><td>OFF</td><td>OFF</td><td>ON</td><td>ON</td><td>OFF</td></tr><tr><td>SW4</td><td>OFF</td><td>OFF</td><td>OFF</td><td>OFF</td><td>ON</td></tr></table> | | Internal RAM | Memory card A | | Memory card B | | *SW2 to 4 are valid if SW1 is OFF. | RAM | ROM | RAM | ROM | SW2 | OFF | ON | OFF | ON | OFF | SW3 | OFF | OFF | ON | ON | OFF | SW4 | OFF | OFF | OFF | OFF | ON |
| | | | | | Internal RAM | Memory card A | | Memory card B | | *SW2 to 4 are valid if SW1 is OFF. | | | | | | | | | | | | | | | | | | | | | |
| | | | RAM | ROM | | RAM | ROM | | | | | | | | | | | | | | | | | | | | | | | | |
| | | SW2 | OFF | ON | OFF | ON | OFF | | | | | | | | | | | | | | | | | | | | | | | | |
| | | SW3 | OFF | OFF | ON | ON | OFF | | | | | | | | | | | | | | | | | | | | | | | | |
| | | SW4 | OFF | OFF | OFF | OFF | ON | | | | | | | | | | | | | | | | | | | | | | | | |
| | | SW5 :System protect. Prevents all CPU module writing and control operations. ON :System protect ON OFF :System protect OFF | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (17) | <div>System setting switch 2</div> <div><div>→ ON</div><div><div><div></div></div>1</div><div><div><div></div></div>2</div></div> | Designates settings required for CPU module operation. All switches are factory set to OFF. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | SW1: For future expansion. Not used at present | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | SW2 : Peripheral protocol. Designates the types of peripheral devices connected to the CPU module peripheral interface. (Set to ON if another ACPU station is to be accessed from a peripheral device. The ON or OFF setting becomes valid immediately upon switching.) | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | ON : ACPU peripheral device 1: For future expansion. Not used at present | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | OFF : QnACPU peripheral device | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| (18) | RS-422 connector | Connector for connection with peripheral devices. | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |

4.5.2 Switch settings and corresponding LED displays

(1) Program writing when CPU module is stopped.

To execute program writing when the CPU module is stopped, follow the key switch setting procedure shown below.

- (a) RUN/STOP key switch :STOP
RUN LED :OFF
Q3ACPU, Q4ACPU display :OFF
..... CPU module STOP status → program write
- (b) RUN/STOP key switch :RESET
RUN LED :OFF
Q3ACPU, Q4ACPU display : "PRG.CHECK!" message is displayed
..... CPU module STOP status
- (c) RUN/STOP key switch :STOP → RUN
RUN LED :ON
Q3ACPU, Q4ACPU display :OFF
..... CPU module STOP status

| POINT |
|---|
| <ul style="list-style-type: none">• After writing a program (except for online program write), perform reset operation, and then place the CPU module in the RUN status.• When remote STOP is switched to RUN, the CPU module is not put in the "PROG CHECK" status but is placed in the RUN status. |

(2) Latch CLEAR operation

To execute a "Latch CLEAR", follow the key switch setting procedure shown below.

- 1) Turn the RUN/STOP key switch of the CPU module from the "STOP" position to the "L. CLR" position several times to flicker the "USER LED" on the CPU module front.
Normally, the LED flickers when the switch is turned several times (three or four times).
When the "USER LED" flickers, it indicates that latch clear is ready.
- 2) After the "USER LED" has flickered, turning the RUN/STOP key switch from the "STOP" position to the "L. CLR" position again executes latch clear and lights up the "USER LED".
If the "USER LED" comes on for two seconds and then goes off, it indicates that latch clear is completed normally.
- 3) To cancel latch clear midway, turn the RUN/STOP key switch to the "RUN" position to place the CPU module in the RUN state, or turn it to the "RESET" position to make a reset.

| | |
|---------------|--|
| POINTS | |
|---------------|--|

- The devices where the "Latch CLEAR" occurs can be designated by the "Latch CLEAR" enabled/disabled settings for each device made in device setting in the parameter mode.
- In addition to the RUN/STOP key switch method, a remote "Latch CLEAR" can also be executed from a GPP function peripheral device. (Refer to the Q2A (S1)/Q3A/Q4ACPU User's Manual).

(3) Removing a memory card while PLC power is ON

To remove the memory card while the PLC power is ON, set the "memory card in/out" switch as shown below. Removing a memory card while power is ON:

(a) Switch ON (build-in LED ON)

..... Memory card insertion/ejection prohibited

(b) Switch OFF (build-in LED OFF)

..... Memory card insertion/ejection enabled →
remove the memory card

| | |
|---------------|--|
| POINTS | |
|---------------|--|

- The built-in LED at the "memory card in/out" switch may not go OFF if a CPU module system function (sampling trace, status latch, etc.) is in progress, or if the memory card is being used by the program. In such cases, stop the system function or the program, then remove the memory card after checking that the switch's built-in LED has turned OFF.
- Do not turn the "memory card in/out" switch ON after removing the memory card. An error will occur if the switch is turned ON at this time.
- When there are parameter-set file registers, local devices or failure history, the memory card cannot be removed.
If the "memory card in/out" switch is turned OFF, the in/out switch built-in LED does not go off.
For the file registers, the memory card can be removed when they are set to be unused with the QDRSET(P) instruction.

(4) Inserting a memory card while PLC power is ON

To insert the memory card while the PLC power is ON, set the "memory card in/out" switch as shown below.

(a) Insert the memory card.

(b) Turn the "memory card in/out" switch ON (built-in LED ON)

..... Memory card insertion/ejection prohibited

| | |
|---------------|--|
| POINTS | |
|---------------|--|

- After inserting the memory card, turn the "memory card in/out" switch ON. The memory card cannot be used until the switch is turned ON.
- Since mount processing is performed again after the memory card is inserted, note that the scan time of one scan when mount processing is performed increases by a maximum of 10ms.

[illegible]

5. I/O MODULE SPECIFICATIONS AND CONNECTIONS

This section presents the specifications and wiring drawings for each of the A series I/O modules.

5.1 Input Modules

5.1.1 Input module specifications

| Model | Input Type | Number of Points/Module | Rated Input Voltage | Input Current | Operating Voltage | | Maximum Simultaneous ON Input Point (Percentage Simultaneous ON) | |
|---------|---------------------------------|-------------------------|---------------------|----------------------------|-------------------|-----------------|--|--|
| | | | | | ON Voltage | OFF Voltage | | |
| AX10 | AC input | 16 points | 100VAC | 10mA | 80VAC or higher | 40VAC or lower | 100% | |
| AX11 | | 32 points | | | | | 60% | |
| AX11EU | | | 200VAC | | 160VAC or higher | 70VAC or lower | 100% | |
| AX20 | | 16 points | | | | | 60% | |
| AX21 | | | | | 32 points | 100% | | |
| AX21EU | | 60% | | | | | | |
| AX40 | DC input (sink type) | 16 points | 12/24 VDC | 4/10mA | 9.5VDC or higher | 6VDC or lower | 100% | |
| AX41 | | 32 points | | | | | 60% | |
| AX41-S1 | | | | | | | 60% *3 | |
| AX42 *1 | | 64 points | | 3/7mA | | | 60% *3 | |
| AX50 | DC input (sink type) | 16 points | 48VDC | 4mA | 34VDC or higher | 10VDC or lower | 100% | |
| AX50-S1 | DC input (sink/source type) | | | 2mA | | | | |
| AX60 | DC input (sink type) | | 100/110/125VDC | | 80VDC or higher | 20VDC or lower | | |
| AX60-S1 | DC input (sink/source type) | | | | | | | |
| AX70 | Sensor input (sink/source type) | 16 points | 5VDC (SW ON) | 3.5mA (TYP) 5.5mA (MAX) | 3.5VDC or higher | 1.1VDC or lower | 100% | |
| | | | 12VDC (SW OFF) | 2mA (TYP) 3mA (MAX) | 5VDC or higher | 2VDC or lower | | |
| | | | 24VDC (SW OFF) | 4.5mA (TYP) 6mA (MAX) | | | | |

| | Input Response Time | | External Connections | Common Terminal Arrangement | Internal Current Consumption | Number of Occupied I/O Points |
|--|---------------------|----------------|-----------------------------|-----------------------------|------------------------------|-------------------------------|
| | OFF to ON | ON to OFF | | | | |
| | 15msec or less | 25msec or less | 20 terminal block connector | 16 points/ common | 0.055A | 16 points |
| | | | 38 terminal block connector | 32 points/ common | 0.11A | 32 points |
| | | | 20 terminal block connector | 16 points/ common | 0.055A | 16 points |
| | | | 38 terminal block connector | 32 points/ common | 0.11A | 32 points |
| | 10msec or less | 10msec or less | 20 terminal block connector | 8 points/ common | 0.055A | 16 points |
| | | | 38 terminal block connector | | 0.11A | 32 points |
| | | | 40-pin connector × 2 | 32 points/ common | 0.12A | 64 point |
| | 10msec or less | 20msec or less | 20 terminal block connector | 8 points/ common | 0.055A | 16 points |
| | | | | | | |
| | 1.5msec or less | 3msec or less | 20 terminal block connector | 8 points/ common | 0.055A | 16 points |

(To next page)

(From front page)

| Model | Input Type | Number of Points/Module | Rated Input Voltage | Input Current | Operating Voltage | | Maximum Simultaneous ON Input Point (Percentage Simultaneous ON) | |
|---------|---------------------------------|-------------------------|------------------------|----------------------------|-----------------------------|---------------------|--|--|
| | | | | | ON Voltage | OFF Voltage | | |
| AX71 | Sensor input (sink/source type) | 32 points | 5VDC (SW ON) | 3.5mA (TYP) 5.5mA (MAX) | 3.5VDC or higher | 1.1VDC or lower | 100% | |
| | | | 12VDC (SW OFF) | 2mA (TYP) 3mA (MAX) | 5VDC or higher | 2VDC or lower | | |
| | | | 24VDC (SW OFF) | 4.5mA (TYP) 6mA (MAX) | | | | |
| AX80 | DC input (source type) | 16 points | 12/24 VDC | 4/10mA | 9.5VDC or higher | 6VDC or lower | | |
| AX80E | | | | | | | | |
| AX81 | | 32 points | | | | | | |
| AX81-S1 | 48/60 VDC | | 3/4mA | 31VDC or higher | 10VDC or lower | | | |
| AX81-S2 | 24VDC | | 4/10mA | 9.5VDC or higher | 6VDC or lower | | | |
| AX81-S3 | | | | | | | | |
| AX81B | DC input (sink/source type) | 32 points | 24VDC | 7mA | At normal input | | 60% | |
| | | | | | 21VDC or higher | 6VDC or lower | | |
| | | | | | When disconnection detected | | | |
| | | | | | 1VDC or higher | 6VDC or lower | | |
| AX82 *1 | DC Input (source type) | 64 points | 12/24 VDC | 3/7mA | 9.5VDC or higher | 6VDC or lower | 60% | |
| AX31 | AC/DC input | 32 points | 12/24 VAC 12/24 VDC | 8.5/4mA | 7VAC/VDC or higher | 2.5VAC/VDC or lower | 100% | |
| AX31-S1 | DC input (sink/source type) | 32 points | 24VAC | | | | | |

| | Input Response Time | | External Connections | Common Terminal Arrangement | Internal Current Consumption | Number of Occupied I/O Points |
|--|--|-----------------|------------------------------|-----------------------------|------------------------------|-------------------------------|
| | OFF to ON | ON to OFF | | | | |
| | 1.5msec or less | 3msec or less | 38 terminal block connector | 8points/ common | 0.11A | 32 points |
| | 10msec or less | 10msec or less | 20 terminal block connector | | 0.055A | 16 points |
| | [TYP] 5.5msec 6.0msec [High-speed mode] 0.5msec or less 1.0msec or less | | | | | |
| | 10msec or less | 10msec or less | 38 terminal block connector | | 0.11A | 32 points |
| | 0.1msec or less | 0.1msec or less | | | | |
| | 10msec or less | 10msec or less | 38 terminal block connector | 8 points/ common | 0.125A | 64 points |
| | 10msec or less | 10msec or less | 37-pin D subconnector × 2 | 32 points/ common | 0.12A | 64 points |
| | 25msec or less | 20msec or less | 38 terminal block connector | | 0.11A | 32 points |
| | 20msec or less | | | | | |
| | 10msec or less | 10msec or less | | | | |

The following specifications apply to all modules:

Isolation method : Photocoupler

Input indication : LEDs

*1 : The ON/OFF status of the first or latter half is indicated by the LEDs in accordance with the setting of the selector switch on the front panel of the module:

FH setting: First half (X00 to X1F), LH setting: Latter half (X20 to X3F)

*2 : It is possible to select high speed or low speed for the upper eight points only using the DIP switch:

HIGH setting: high-speed, LOW setting: low-speed

*3: The number of simultaneous input points is 40% (13 inputs/common) simultaneously ON when the unit is used adjacent to the power supply module.

5.1.2 Input module connections

| | Model | Rated Input Voltage |
|-----|-------|---------------------|
| (1) | AX10 | 100-120 VAC |
| | AX20 | 200-240 VAC |

* 9 and 18 are connected internally.

| | Model | Rated Input Voltage |
|-----|-------|---------------------|
| (2) | AX11 | 100-120 VAC |
| | AX21 | 200-240 VAC |

* 9 and 18 , and 27 and 36 are connected internally.

| | Model | Rated Input Voltage |
|-----|-------|---------------------|
| (3) | AX40 | 12/24 VDC |
| | AX50 | 48 VDC |

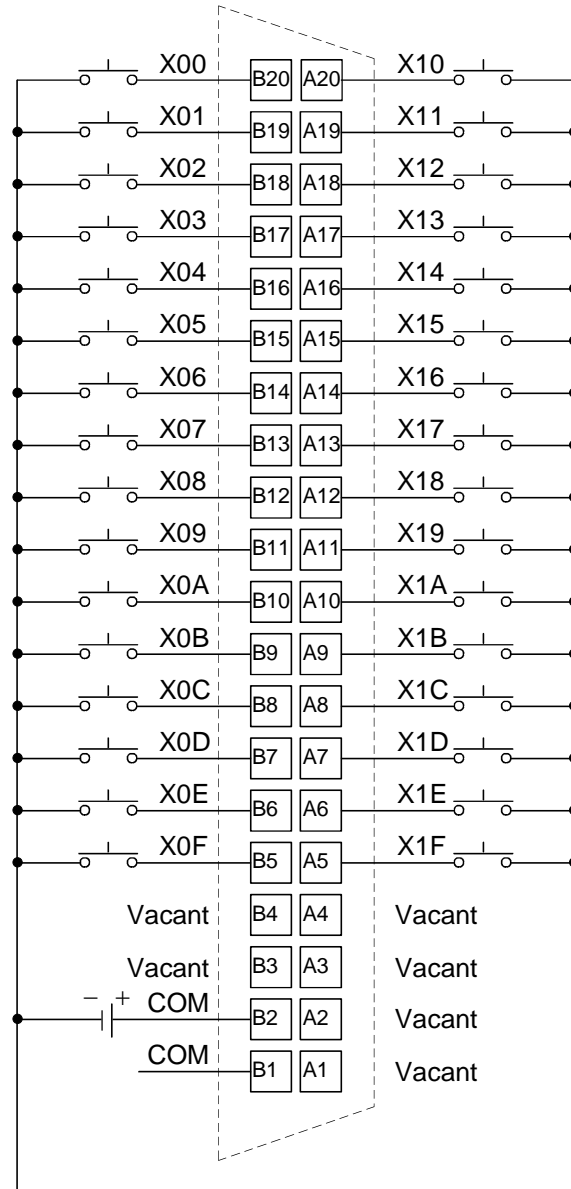
* 9 and 18 are connected internally.

| | Model | Rated Input Voltage |
|-----|-------|---------------------|
| (4) | AX41 | 12/24 VDC |

* 9 and 18 , and 27 and 36 are connected internally.

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| | | |
|-----|--------------|----------------------------|
| (5) | Model | Rated Input Voltage |
| | AX42 | 12/24 VDC |



* The figure above indicates **F** (the first half 32 points).
The connections for **L** (the latter half 32 points) are the same
as for **F** (regard X00 to X1F as X20 to X3F).
B1 and **B2** are connected internally.

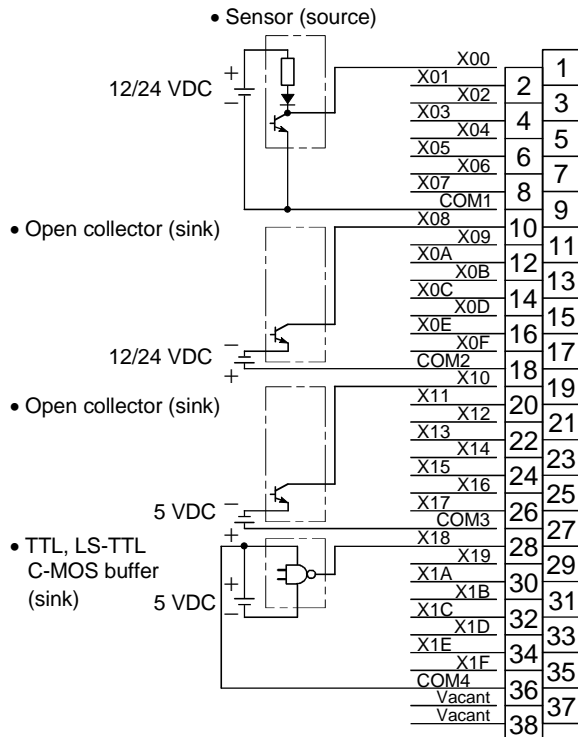
| | | |
|--|---------|---------------------|
| (6) | Model | Rated Input Voltage |
| | AX50-S1 | 48 VDC |
| <div><div><div><div><div>X00</div><div>X01</div><div>X02</div><div>X03</div><div>X04</div><div>X05</div><div>X06</div><div>X07</div><div>COM1</div><div>X08</div><div>X09</div><div>X0A</div><div>X0B</div><div>X0C</div><div>X0D</div><div>X0E</div><div>X0F</div><div>COM2</div><div>Vacant</div><div>Vacant</div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div><div>9</div><div>10</div><div>11</div><div>12</div><div>13</div><div>14</div><div>15</div><div>16</div><div>17</div><div>18</div><div>19</div><div>20</div></div></div></div></div> | | |

| | | |
|--|---------|---------------------|
| (8) | Model | Rated Input Voltage |
| | AX60-S1 | 100/110/125 VAC |
| <div><div><div><div><div>X00</div><div>X01</div><div>X02</div><div>X03</div><div>X04</div><div>X05</div><div>X06</div><div>X07</div><div>COM1</div><div>X08</div><div>X09</div><div>X0A</div><div>X0B</div><div>X0C</div><div>X0D</div><div>X0E</div><div>X0F</div><div>COM2</div><div>Vacant</div><div>Vacant</div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div><div>9</div><div>10</div><div>11</div><div>12</div><div>13</div><div>14</div><div>15</div><div>16</div><div>17</div><div>18</div><div>19</div><div>20</div></div></div></div></div> | | |

| | | |
|--|-------|---------------------|
| (7) | Model | Rated Input Voltage |
| | AX60 | 100/110/125 VDC |
| <div><div><div><div><div>X00</div><div>X01</div><div>X02</div><div>X03</div><div>X04</div><div>X05</div><div>X06</div><div>X07</div><div>COM</div><div>X08</div><div>X09</div><div>X0A</div><div>X0B</div><div>X0C</div><div>X0D</div><div>X0E</div><div>X0F</div><div>COM</div><div>Vacant</div><div>Vacant</div></div><div><div>1</div><div>2</div><div>3</div><div>4</div><div>5</div><div>6</div><div>7</div><div>8</div><div>9</div><div>10</div><div>11</div><div>12</div><div>13</div><div>14</div><div>15</div><div>16</div><div>17</div><div>18</div><div>19</div><div>20</div></div></div></div></div> | | |

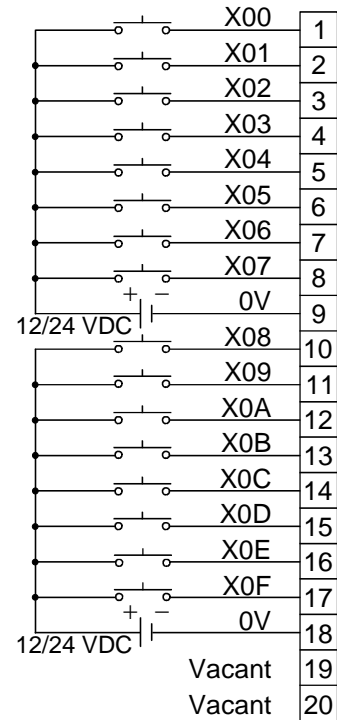
| | | |
|--|-------|---------------------|
| (9) | Model | Rated Input Voltage |
| | AX70 | 5/12/24 VDC |
| <div><div><div><div><div><div><div>• Sensor (source)</div><div><div><div><div>12/24 VDC</div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></div><div></d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v></div><div></div><div></div></div></div></div></div></div></div></div></div></div> | | |

| (10) | Model | Rated Input Voltage |
|------|-------|---------------------|
| | AX71 | 5/12/24 VDC |

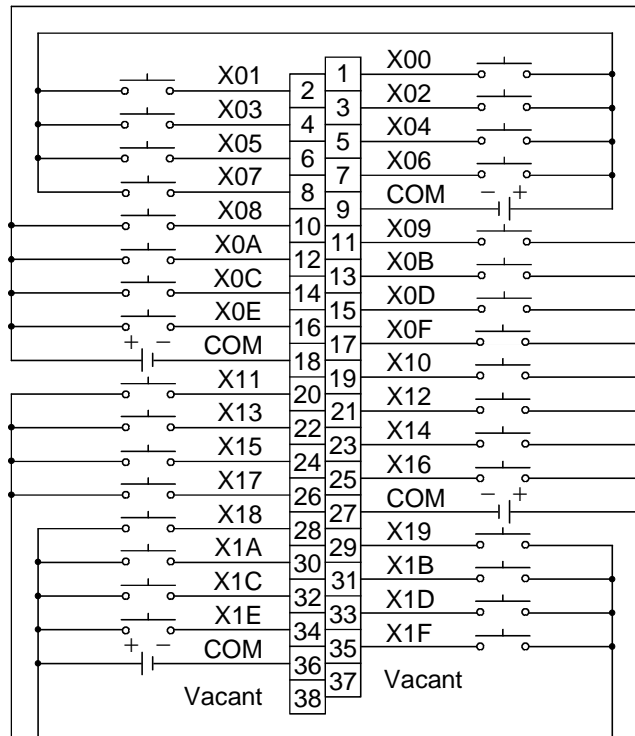


- Can be used in any combination in units of 8 points per common.
- When using the COMS source type, only CMOSs with a 5 VDC rating as shown above can be used (e.g. HCMOS).

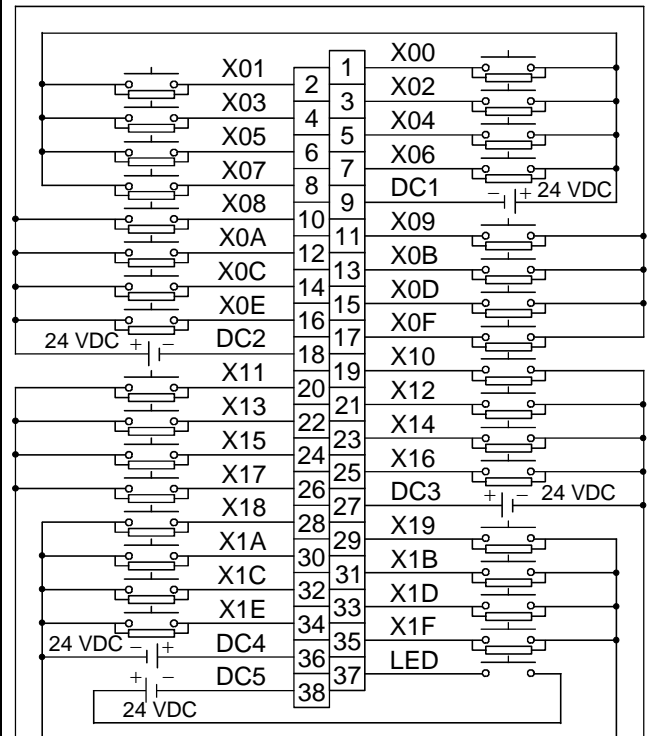
| (11) | Model | Rated Input Voltage |
|------|-------|---------------------|
| | AX80 | 12/24 VDC |
| | AX80E | |



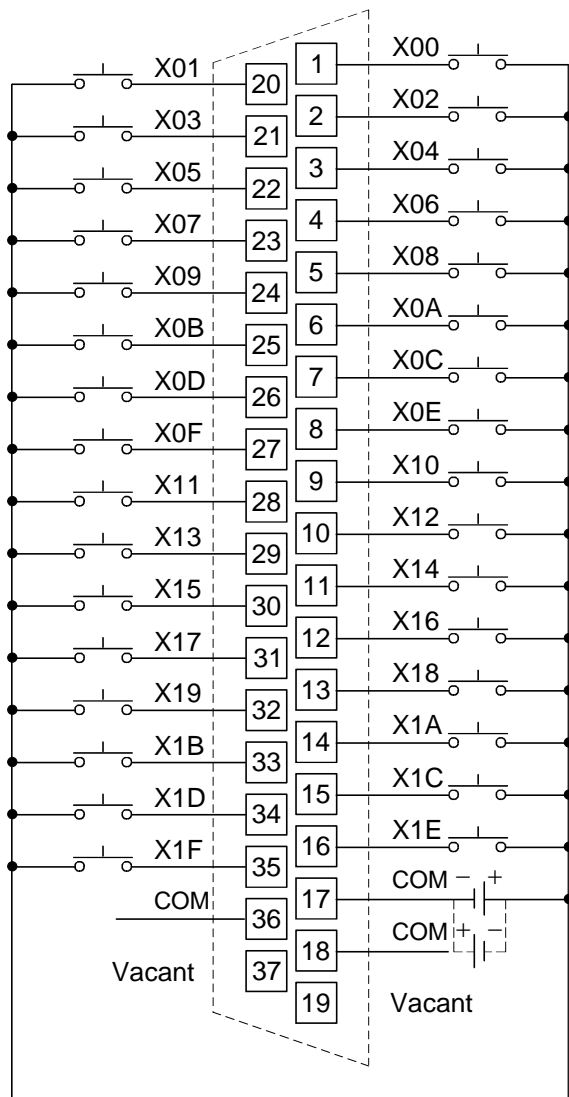
| (12) | Model | Rated Input Voltage |
|------|---------|---------------------|
| | AX81 | 12/24 VDC |
| | AX81-S1 | |
| | AX81-S2 | 48/60 VDC |
| | AX81-S3 | 12/24 VDC |



| (13) | Model | Rated Input Voltage |
|------|-------|---------------------|
| | AX81B | 24 VDC |



| (14) | Model | Rated Input Voltage |
|------|-------|---------------------|
| | AX82 | 12/24 VDC |



* The figure above indicates **F** (the first half 35 points).

The connections for **L** (the latter half 32 points) are the same as for **F** (regard X00 to X1F as X20 to X3F).

17 , **18** , and **36** are connected internally.

| | | |
|------|--------------|----------------------------|
| (15) | Model | Rated Input Voltage |
| | AX31 | 12/24 VAC 12/24 VDC |

Diagram showing the pin configuration for model AX31. The diagram illustrates the internal connections for the 38 pins. Pins 1 through 35 are organized into 19 pairs (X00 to X1F). Pins 36, 37, and 38 are designated as COM, Vacant, and Vacant respectively. A note indicates that pins 9, 18, 27, and 36 are connected internally.

* 9 and 18 , and 27 and 36 are connected internally.

| | | |
|------|--------------|----------------------------|
| (16) | Model | Rated Input Voltage |
| | AX31-S1 | 24 VDC |

Diagram showing the pin configuration for model AX31-S1. The diagram illustrates the internal connections for the 38 pins. Pins 1 through 35 are organized into 19 pairs (X00 to X1F). Pins 36, 37, and 38 are designated as COM, Vacant, and Vacant respectively. A note indicates that pins 9, 18, 27, and 36 are connected internally.

* 9 and 18 , and 27 and 36 are connected internally.

5.2 Output Modules

5.2.1 Output module specifications

| Model | Output Type | No. of Points/ Module | Rated Load Voltage | Max. Load Current | | Input Response Time | | | |
|---------|--|--------------------------|--------------------|-------------------|--------------------|---------------------|---|--|----|
| | | | | Per Point | Per Common | OFF to ON | ON to OFF | | |
| AY10 | Contact output | 16 points | 240VAC 24VAC | 2A | 8A | 10msec or less | 12msec or less | | |
| AY10A | Contact output (All points independent) | | | | 16A/all points | | | | |
| AY11 | Contact output | | | | 8A | | | | |
| AY11A | Contact output (All points independent) | | | | 16A/all points | | | | |
| AY11AEU | | | | | 16A/all points | | | | |
| AY11E | | | | | 8A | | | | |
| AY11EEU | | | | | | | | | |
| AY13 | Contact output | | | | 32 points | | | | 5A |
| AY13E | | | | | | | | | |
| AY13EEU | | | | | | | | | |
| AY15EU | | 24 points | 8A | | | | | | |
| AY20EU | Triac output | 16 points | 100 to 200 VAC | 0.6A | 1.9A | 1msec or less | 0.5Hz + 1msec or less | | |
| AY22 | | | | 2A | 3.3A | | | | |
| AY23 | | 32 points | | 0.6A | 2.4A *4 (1.05A) | | | | |
| AY40 | Transistor output (sink type) | 16 points | 12/24VDC | 0.1A | 0.8A | 2msec or less | 2msec or less (resistive load) | | |
| AY40A | Transistor output (all points independent sink type) | | | 0.3A | — | | | | |
| AY40P | Transistor output (sink type) | | | 0.1A | 0.8A | | | | |

| | External Connections | Common Terminal Arrangement | Surge Suppression | Fuse Rating | Error Display | External Power Supply (TYP 24VDC) | Internal Current Consumption | Number of Occupied I/O Points | |
|--|-----------------------------|------------------------------------|-----------------------|-------------|---------------|-----------------------------------|------------------------------|-------------------------------|-----------|
| | | | | | | Current | | | |
| | 20 terminal block connector | 8 points/ common | None | None | None | 0.15A | 0.115A | 16 points | |
| | 38 terminal block connector | No common (all points independent) | | | | | | | |
| | 20 terminal block connector | 8 points/ common | Varistor | | | | | | |
| | 38 terminal block connector | No common (all points independent) | | | | | | | |
| | 20 terminal block connector | 8 points/ common | None | 8A | | 0.29A | 0.23A | 32 points | |
| | 38 terminal block connector | | | None | | | | | 8A |
| | 38 terminal block connector | 4 points/ common | CR absorber | 3.2A | Display | — | 0.4A | 16 points | |
| | 20 terminal block connector | 8 points/ common | CR absorber varistor | 7A *6 | Display *10 | | 0.305A | 16 points | |
| | 38 terminal block connector | | Absorber | 3.2A *6 | None | | 0.59A | 32 points | |
| | 20 terminal block connector | No common (all points independent) | Clamp diode | None | | None | 0.008A | 0.115A | 16 points |
| | 38 terminal block connector | | Surge absorbing diode | | | | — | 0.19A | |
| | 20 terminal block connector | 8 points/ common | Cramp diode | | 0.015A | | 0.115A | | |

(To next page)

(From front page)

| Model | Output Type | No. of Points/ Module | Rated Load Voltage | Max. Load Current | | Input Response Time | | |
|------------|--|---------------------------------|--------------------|-------------------|--------------|---------------------|--------------------------------|--|
| | | | | Per Point | Per Common | OFF to ON | ON to OFF | |
| AY41 | Transistor output (sink type) | 32 points | 12/24VDC | 0.1A | 1.6A | 2msec or less | 2msec or less (resistive load) | |
| AY41P | | | | | 1A | | | |
| AY42 *1 | | 64 points | | 0.1A | 2A *4 (1.6A) | | | |
| AY42-S1 *1 | | | | | 2A | | | |
| AY42-S3 *1 | | | | 0.1A *5 | 2A | | | |
| AY42-S4 *1 | | | | 0.1A | 1.92A | | | |
| AY50 | | 16 points | | 0.5A | 2A | | | |
| AY51 | | 32 points | | | 2A *4 (3.3A) | | | |
| AY51-S1 | | | | 0.3A | 2A | | | |
| AY60 | | Transistor output (source type) | | 16 points | 2A | | | |
| AY60E | 12/24VDC 2A 48VDC 0.8A | | 3A | | | | | |
| AY60EP | 12/24VDC | | 12VDC 2A | | 9.6A | 0.5msec or less | 1.5msec or less | |
| | | | 24VDC 0.8A | | 3.8A | | | |
| AY60S | Transistor output (sink type) | | 24/48VDC (12V) *3 | 2A | 6.4A | 1msec or less | 3msec or less (resistive load) | |
| AY70 | Transistor output (for TTL. COMOS) (sink type) | 16 points | 5/12VDC | 0.016A | 0.128A | 1msec or less | 1msec or less | |
| AY71 | | 32 points | | 0.016A | 0.256A | | | |
| AY72 *1 | | 64 points | | 0.016A | 0.512A | | | |

| | External Connections | Common Terminal Arrangement | Surge Suppression | Fuse Rating | Error Display | External Power Supply (TYP 24VDC) | Internal Current Consumption | Number of Occupied I/O Points |
|----------|-----------------------------|-----------------------------|------------------------------------|-------------|---------------|-----------------------------------|------------------------------|-------------------------------|
| | | | | | | Current | | |
| | 38 terminal block connector | 16 points/ common | Cramp diode | None | None | 0.02A | 0.23A | 32 points |
| | | | | | | 0.03A | | |
| | 40-pin connector × 2 | 32 points/ common | Cramp diode | None | None | 0.04A | 0.34A | 32 points |
| | | | | | | | | |
| | | | 1.6A *7 | Display *11 | | 0.29A | 64 points | |
| | | | Photo coupler Built-in Zener diode | None | None | — | | 0.5A |
| | 20 terminal block connector | 8 points/ common | Varistor | 2A *6 | Display *10 | 0.065A | 0.115A | 16 points |
| | 38 terminal block connector | 16 points/ common | | None | None | 0.05A | 0.023A | 32 points |
| | | | Transistor Built-in Zener diode | 1A *8 | Display *10 | 0.1A | 0.31A | |
| | 20 terminal block connector | 8 points/ common | Varistor | 3.2A *9 | Display | 0.065A | 0.115A | 16 points |
| | | | Surge absorbing diode | 5A *9 | | 0.065A | | |
| | | | | None | None | 0.11A | | |
| | | | Varistor | 5A *9 | | 0.003A | 0.075A | |
| | | | None | None | | None | *12 0.055A | 0.1A |
| | | | | | *12 0.1A | | 0.2A | 32 points |
| *12 0.3A | | | | | 0.3A | | 64 points | |

(To next page)

(From front page)

| Model | Output Type | No. of Points/ Module | Rated Load Voltage | Max. Load Current | | Input Response Time | | |
|--------------|---------------------------------|--------------------------|--------------------|-------------------|------------|---------------------|--------------------------------|--|
| | | | | Per Point | Per Common | OFF to ON | ON to OFF | |
| AY80 | Transistor output (source type) | 16 points | 12/24VDC | 0.5A | 2A | 2msec of less | 2msec of less (resistive load) | |
| AY80EP | | | | 0.8A | 3.84A | 0.5msec or less | 1.5msec or less | |
| AY81 | Transistor output (source type) | 32 points | 12/24VDC | 0.5A | 4A | 2msec of less | 2msec of less (resistive load) | |
| AY81EP | | | | 12VDC 0.8A | 7.68A | 0.5msec or less | 1.5msec or less | |
| | | | | 24VDC 0.4A | 3.84A | | | |
| *1 AY82EP | | 64 points | | 12VDC 0.1A | 1.92A | | | |
| | | | | 24VDC 0.04A | 0.758A | | | |

| | External Connections | Common Terminal Arrangement | Surge Suppression | Fuse Rating | Error Display | External Power Supply (TYP 24VDC) | Internal Current Consumption | Number of Occupied I/O Points |
|--|-----------------------------|-----------------------------|-----------------------|-------------|---------------|-----------------------------------|------------------------------|-------------------------------|
| | | | | | | Current | | |
| | 20 terminal block connector | 8 points/ common | Varistor | 2A *6 | Display *10 | 0.06A | 0.115A | 16 points |
| | | | Surge absorbing diode | None | None | 0.11A | | |
| | 38 terminal block connector | 16 points/ common | Varistor | None | None | 0.05A | 0.23A | 32 points |
| | | | Surge absorbing diode | | | 0.22A | | |
| | 40-pin connector × 2 | 32 points/ common | | | | 0.05A | 0.29A | 64 points |

The following specifications apply to all modules:

Isolation method : Photocoupler

Input indication : LEDs

- *1 : The ON/OFF status of the first or latter half is indicated by the LEDs in accordance with the setting of the selector switch on the front panel of the module:
FH setting: First half (X00 to X1F), LH setting: Latter half (X20 to X3F)
- *2 : When 12/48 VDC is used as the load power supply, a separate 24 VDC power supply must be used as an external power supply.
- *3 : When 12 VDC is used as the load power supply, a separate 24/48 VDC power supply must be used as an external power supply.
- *4 : When the module is installed adjacent to the power supply module, the value indicated in parentheses applies.
- *5 : The maximum load current differs depending on the number of simultaneously ON points.
- *6 : Fast-melting fuse (one per common)
- *7 : Normal fuse (two per common)
- *8 : Fast-melting fuse (two per 8-per-common unit)
- *9 : Fast-melting fuse (two per common)
- *10 : LED comes on when a fuse blows or the external power supply is turned off.
- *11 : Since this is a built-in fuse directly fixed to the module, replace the entire module if it blows.
- *12 : TYP. 12 VDC

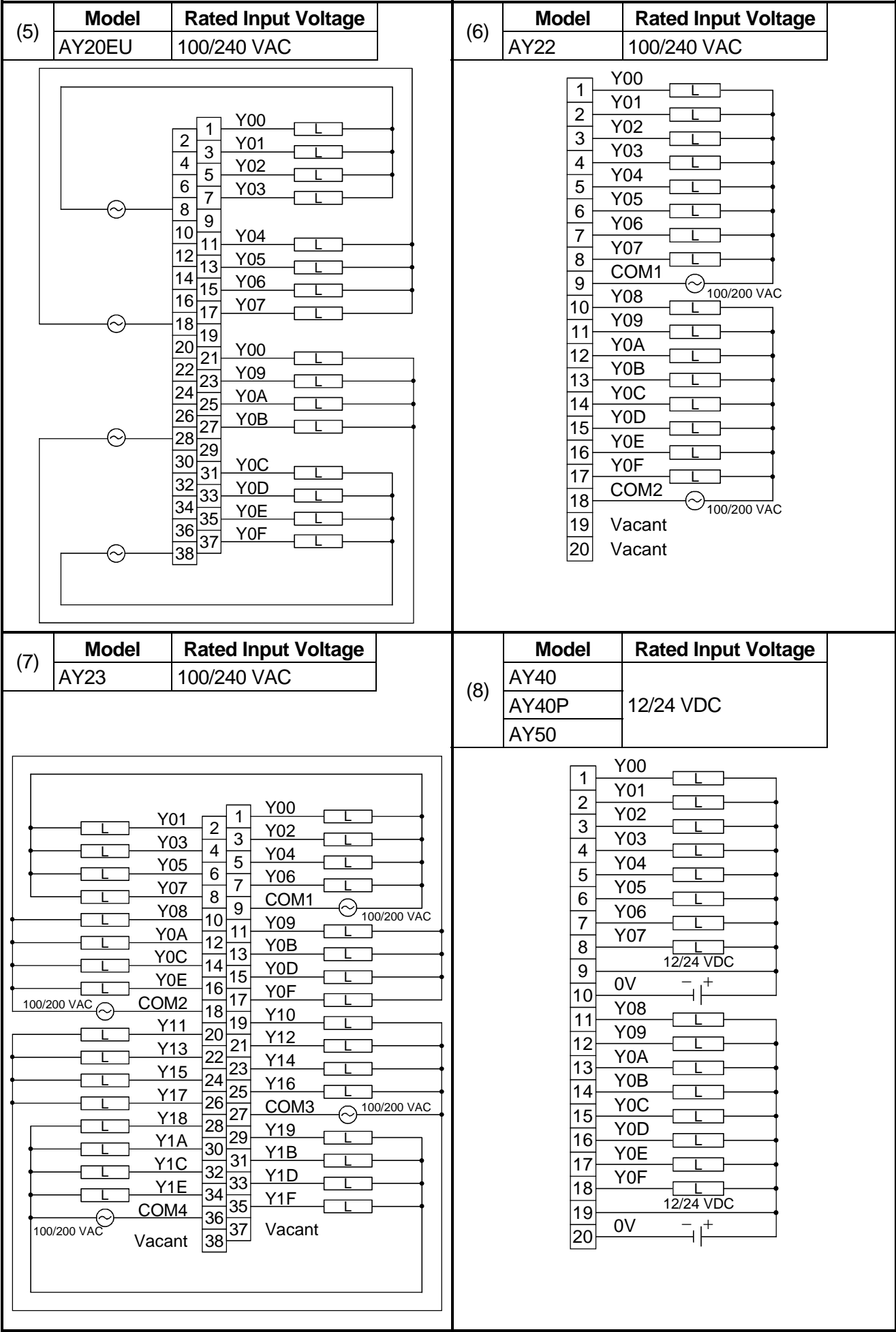
5.2.2 Output module connections

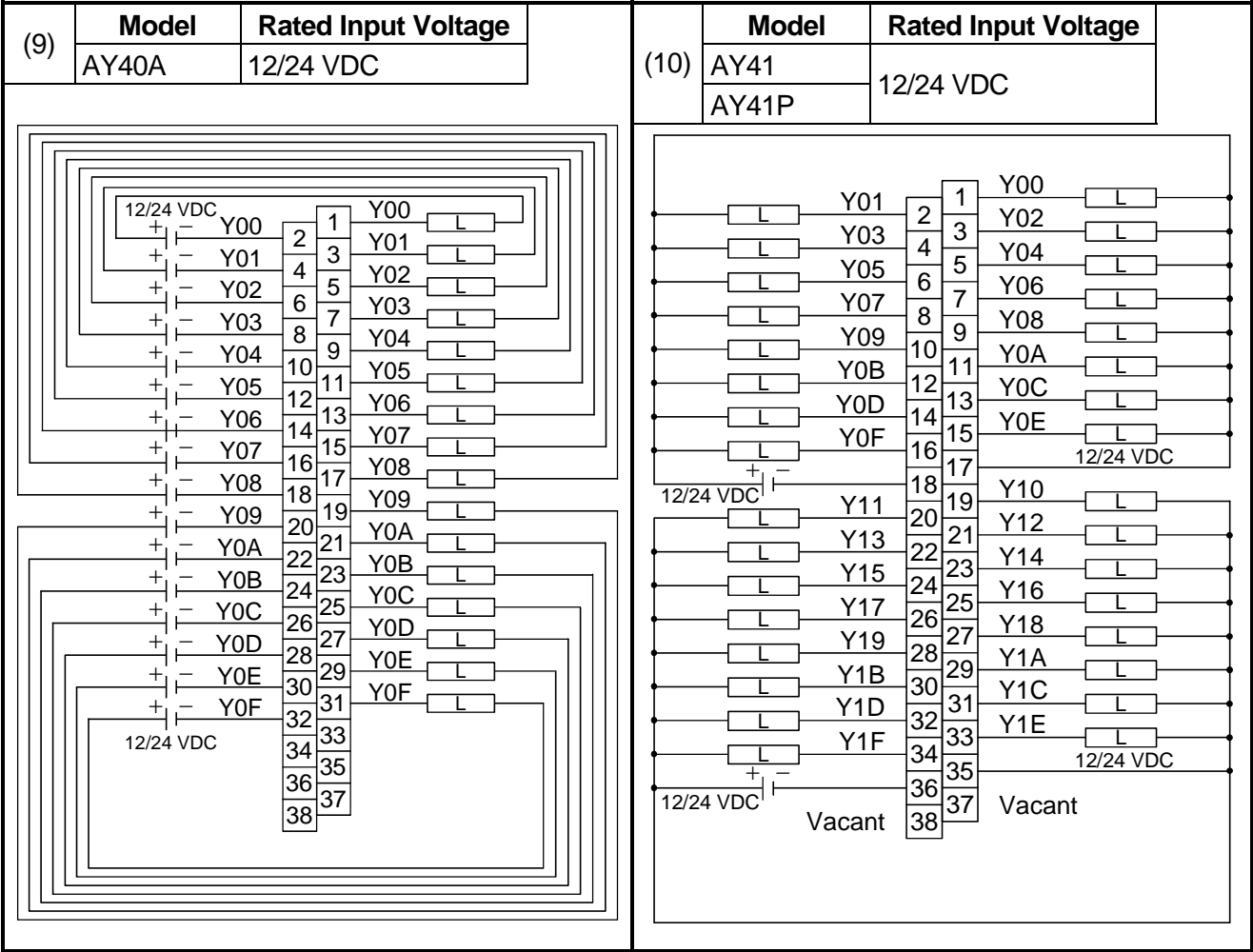
| | Model | Rated Input Voltage |
|-----|---------|---------------------|
| (1) | AY10 | 24 VDC 240 VAC |
| | AY11 | |
| | AY11E | |
| | AY11EEU | |

*: The external load power supply section is as shown below.

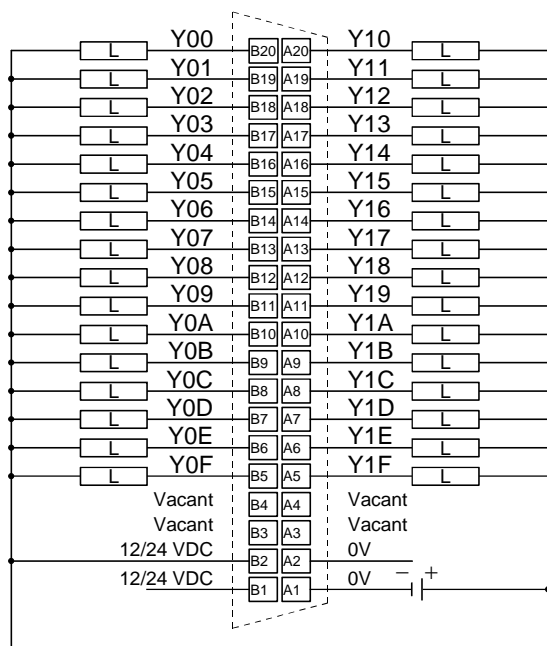
| | Model | Rated Input Voltage |
|-----|---------|---------------------|
| (2) | AY10A | 24 VDC/240 VAC |
| | AY11A | |
| | AY11AEU | |

*: The external load power supply section is as shown below.





| | | |
|------|--------------|----------------------------|
| (11) | Model | Rated Input Voltage |
| | AY42 | 12/24 VDC |
| | AY42-S1 | |
| | AY42-S3 | |

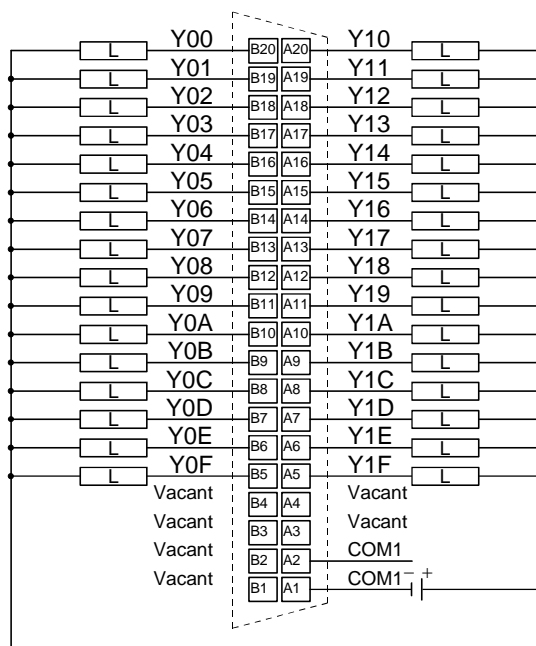


* The figure above indicates **F** (the first half 32 points).

The connections for **L** (the latter half 32 points) are the same as for **F** (regard Y00 to Y1F as Y20 to Y3F).

B1 and **B2** , and **A1** and **A2** are connected internally.

| | | |
|------|--------------|----------------------------|
| (12) | Model | Rated Input Voltage |
| | AY42-S4 | 12/24 VDC |



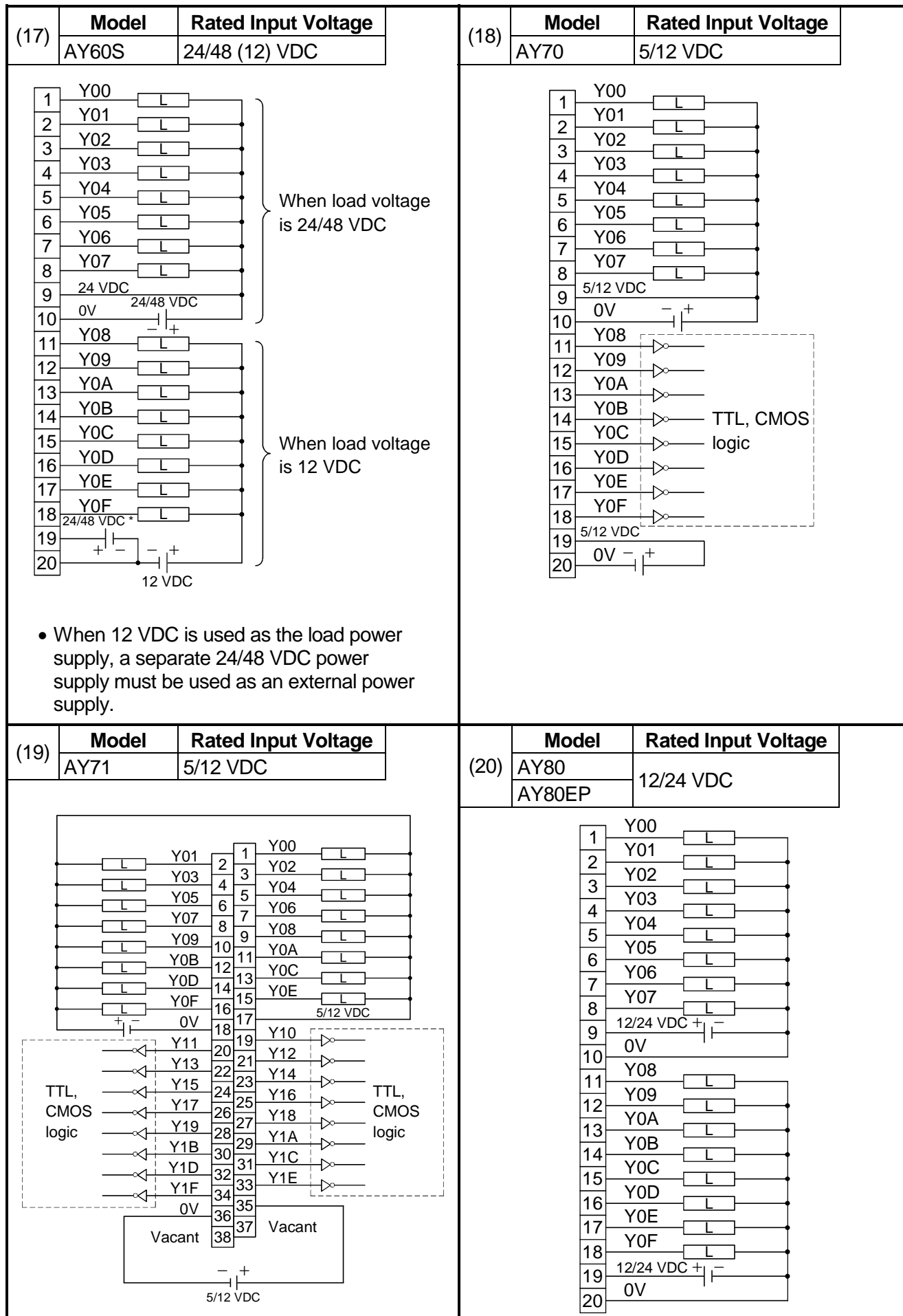
* The figure above indicates **F** (the first half 32 points).
The connections for **L** (the latter half 32 points) are the same as for **F** (regard Y00 to Y1F as Y20 to Y3F).
Regard COM1 as COM2.
B1 and **B2** , and **A1** and **A2** are connected internally.

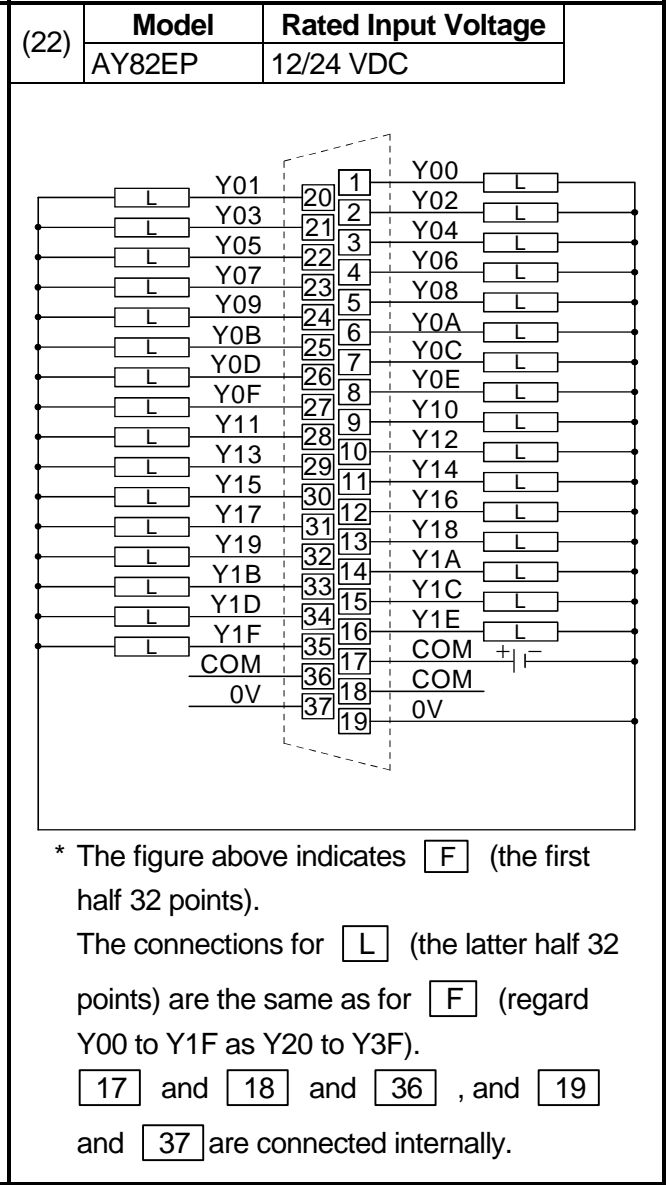
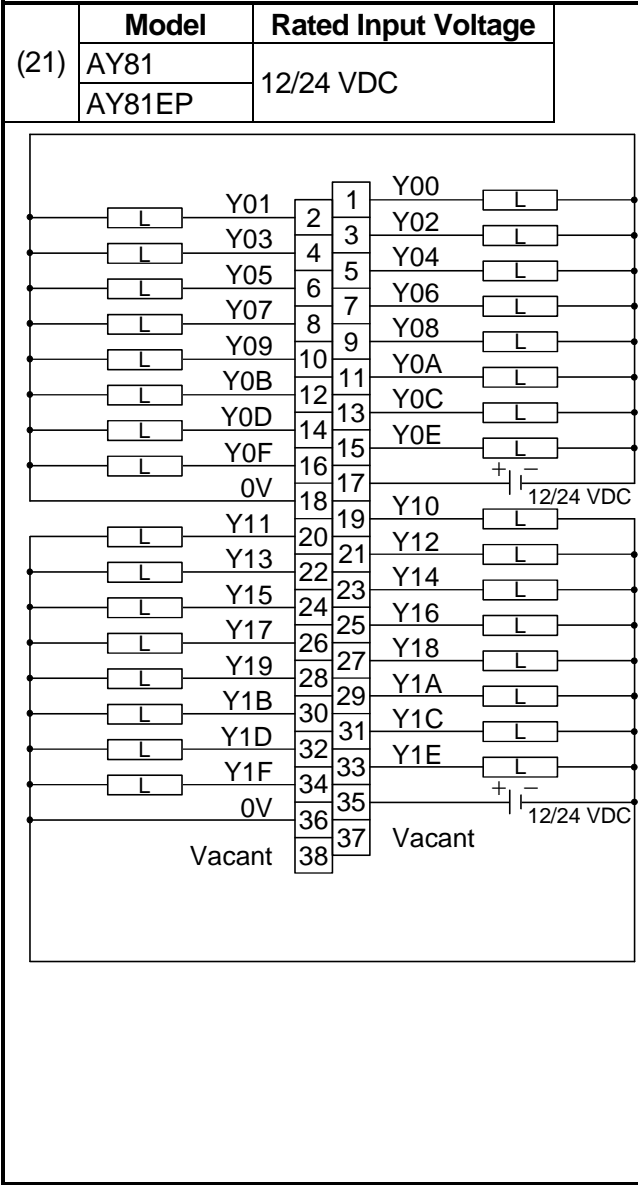
| (13) | Model | Rated Input Voltage |
|------|---------|---------------------|
| | AY51 | 12/24 VDC |
| | AY51-S1 | |
| | | |

| (14) | Model | Rated Input Voltage |
|---|-------|---------------------|
| | AY60 | 24 (12/48) VDC |
| | | |
| <ul style="list-style-type: none">When 12/48 VDC is used as the load power supply, a separate 24 VDC power supply must be used as an external power supply. | | |

| (15) | Model | Rated Input Voltage |
|---|-------|---------------------|
| | AY60E | 24 (12/48) VDC |
| | | |
| <ul style="list-style-type: none">When 12/48 VDC is used as the load power supply, a separate 24 VDC power supply must be used as an external power supply. | | |

| (16) | Model | Rated Input Voltage |
|------|--------|---------------------|
| | AY60EP | 12/24 VDC |
| | | |





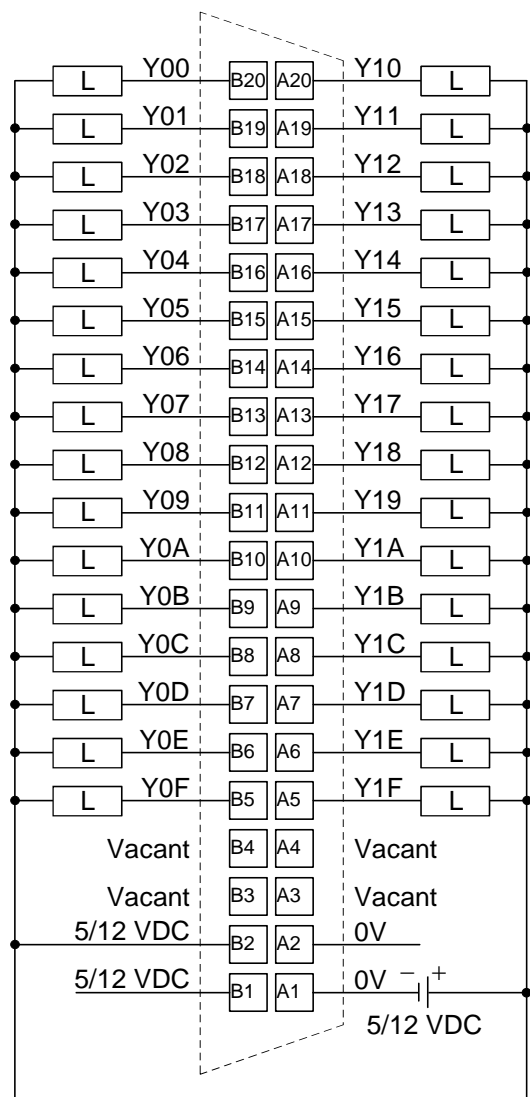
* The figure above indicates **F** (the first half 32 points).

The connections for **L** (the latter half 32 points) are the same as for **F** (regard Y00 to Y1F as Y20 to Y3F).

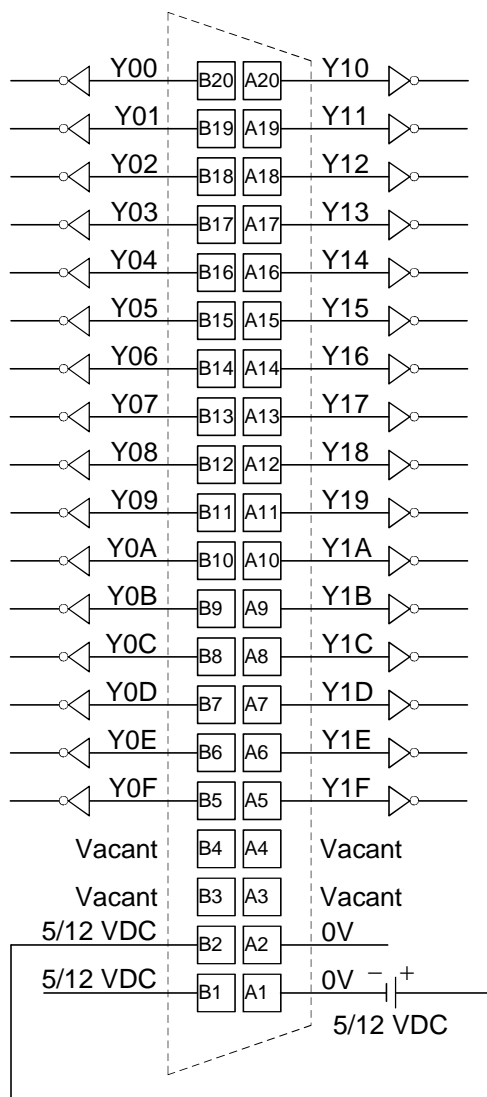
17 and **18** and **36** , and **19** and **37** are connected internally.

| (23) | Model | Rated Input Voltage |
|------|-------|---------------------|
| | AY72 | 5/12 VDC |

Load connection



TTL, CMOS logic



* The figure above indicates **F** (the first half 32 points).

The connections for **L** (the latter half 32 points) are the same as for **F** (regard Y00 to Y1F as Y20 to Y3F).

B1 and **B2** , and **A1** and **A2** are connected internally.

[illegible]

5.3 Input/Output Combined Modules

5.3.1 Input/output combined module specifications

| Model | Input Type | Number of Points/Module | Isolation Method | Rated Input Voltage | Input Current | Operating Voltage | | |
|-------|----------------------|-------------------------|-------------------------|---------------------|---------------|-------------------|---------------|--|
| | | | | | | ON Voltage | OFF Voltage | |
| A42XY | Dynamic scan | 64 points *1 | Photocoupler insulation | 12/24VDC | | 7VDC or higher | 3VDC or lower | |
| AH42 | DC input (sink type) | 32 points | | | 3/7mA | 9.5VDC or higher | 6VDC or lower | |

| Model | Output Type | No. of Points/Module | Rated Load Voltage | Max. Load Current | | Input Response Time | | |
|-------|-------------------------------|----------------------|--------------------|-------------------|------------|---------------------|----------------|--|
| | | | | Per Point | Per Common | OFF to ON | ON to OFF | |
| A42XY | Dynamic scan | 64 points | 12/24VDC | 50mA | — | 16msec or less | 16msec or less | |
| AH42 | Transistor output (sink type) | 32 points | | 0.1A | 1A | 2msec or less | 2msec or less | |

| | Maximum Simultaneous ON Input Point (Percentage Simultaneous ON) | Input Response Time | | Input Display | External Connections | Common Terminal Arrangement |
|-----|--|---------------------|----------------|---------------|----------------------|-----------------------------|
| | | OFF to ON | ON to OFF | | | |
| 60% | | 16msec or less | 16msec or less | LED display | 16-pin connector | — |
| | | 10msec or less | 10msec or less | | 40-pin connector × 2 | 30 points/ common |

| | External Connections | Common Terminal Arrangement | Surge Suppression | Fuse Rating | Error Display | External Power Supply (TYP 24VDC) | Internal Current Consumption | Number of Occupied I/O Points |
|--|----------------------|-----------------------------|-------------------|-------------|---------------|-----------------------------------|------------------------------|-------------------------------|
| | | | | | | Current | | |
| | 32-pin connector | — | None | None | None | 0.18A | 0.11A | 64 points *1 |
| | 40-pin connector × 2 | 32 points/ common | Clamp diode | | | 0.04A | 0.245A | 64 points *2 |

*1 : The same numbers are allocated to both input and output points. The number of occupied I/O points is 64.

*2 : The first half 32 points are allocated to input and the latter half 32 points are allocated to output. Thus, the number of occupied I/O points is 64. When I/O allocation is carried out at a peripheral device, both modules should be set as 64-point output modules.

5.3.2 Input/output combined module connections

(1)

| Model | Rated Input Voltage | Rated Load Voltage |
|-------|---------------------|--------------------|
| A42XY | 12/24 VDC | 12/24 VDC |

Input side

Input terminals

| | | | | | | | |
|-----|-----|-----|-----|-----|-----|-----|-----|
| X38 | X30 | X28 | X20 | X18 | X10 | X08 | X00 |
| X39 | X31 | X29 | X21 | X19 | X11 | X09 | X01 |
| X3A | X32 | X2A | X22 | X1A | X12 | X0A | X02 |
| X3B | X33 | X2B | X23 | X1B | X13 | X0B | X03 |
| X3C | X34 | X2C | X24 | X1C | X14 | X0C | X04 |
| X3D | X35 | X2D | X25 | X1D | X15 | X0D | X05 |
| X3E | X36 | X2E | X26 | X1E | X16 | X0E | X06 |
| X3F | X37 | X2F | X27 | X1F | X17 | X0F | X07 |

Pin No.

| | |
|----|-------|
| 1A | XD0 |
| 1B | XD1 |
| 2A | XD2 |
| 2B | XD3 |
| 3A | XD4 |
| 3B | XD5 |
| 4A | XD6 |
| 4B | XD7 |
| 5A | XSCN0 |
| 5B | XSCN1 |
| 6A | XSCN2 |
| 6B | XSCN3 |
| 7A | XSCN4 |
| 7B | XSCN5 |
| 8A | XSCN6 |
| 8B | XSCN7 |

12/24 VDC

12/24 VDC

12/24 GDC

Internal control circuit

Internal scan at 1/8th duty

1A ○ ○ 1B

2A ○ ○ 2B

3A ○ ○ 3B

4A ○ ○ 4B

5A ○ ○ 5B

6A ○ ○ 6B

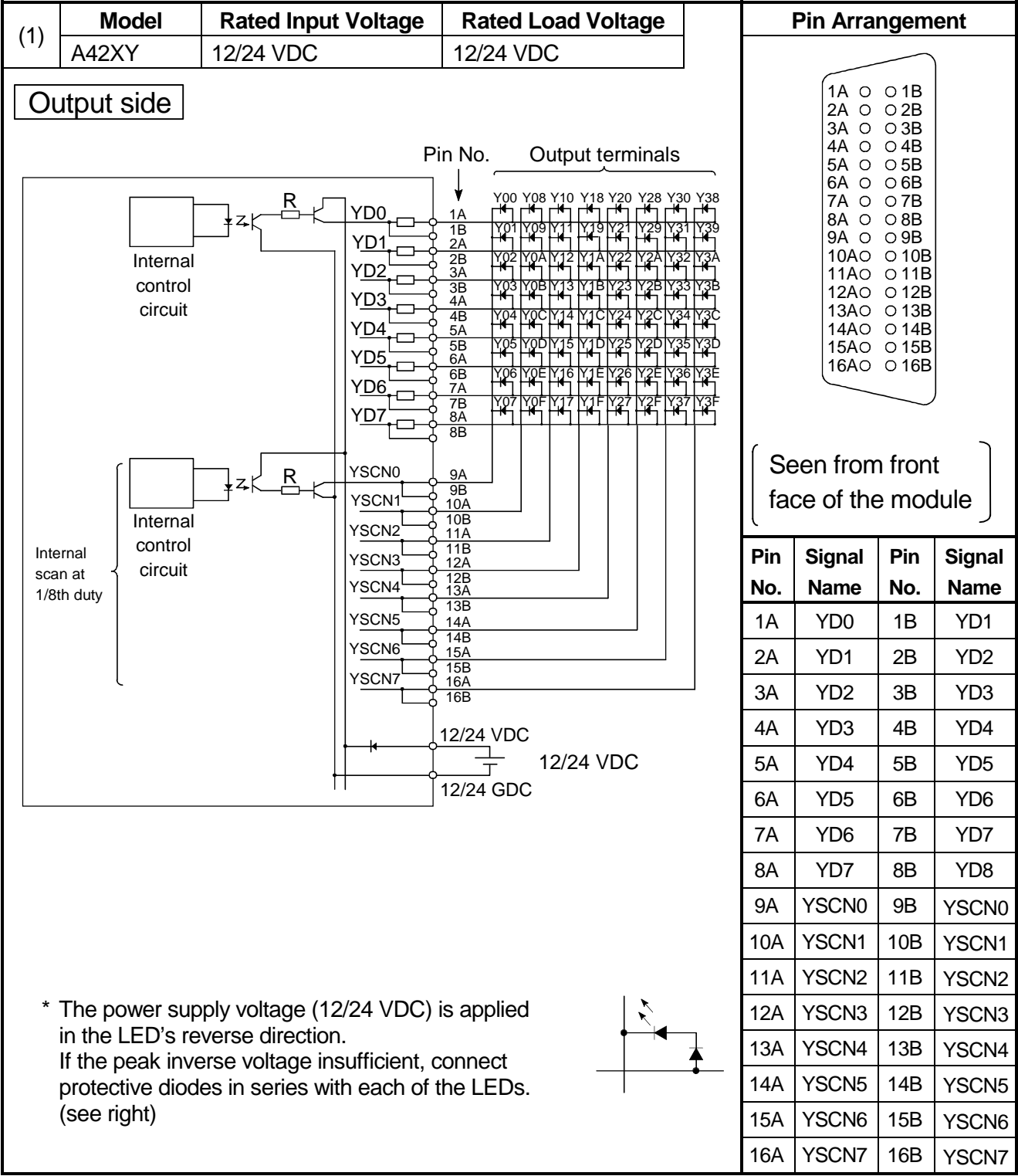
7A ○ ○ 7B

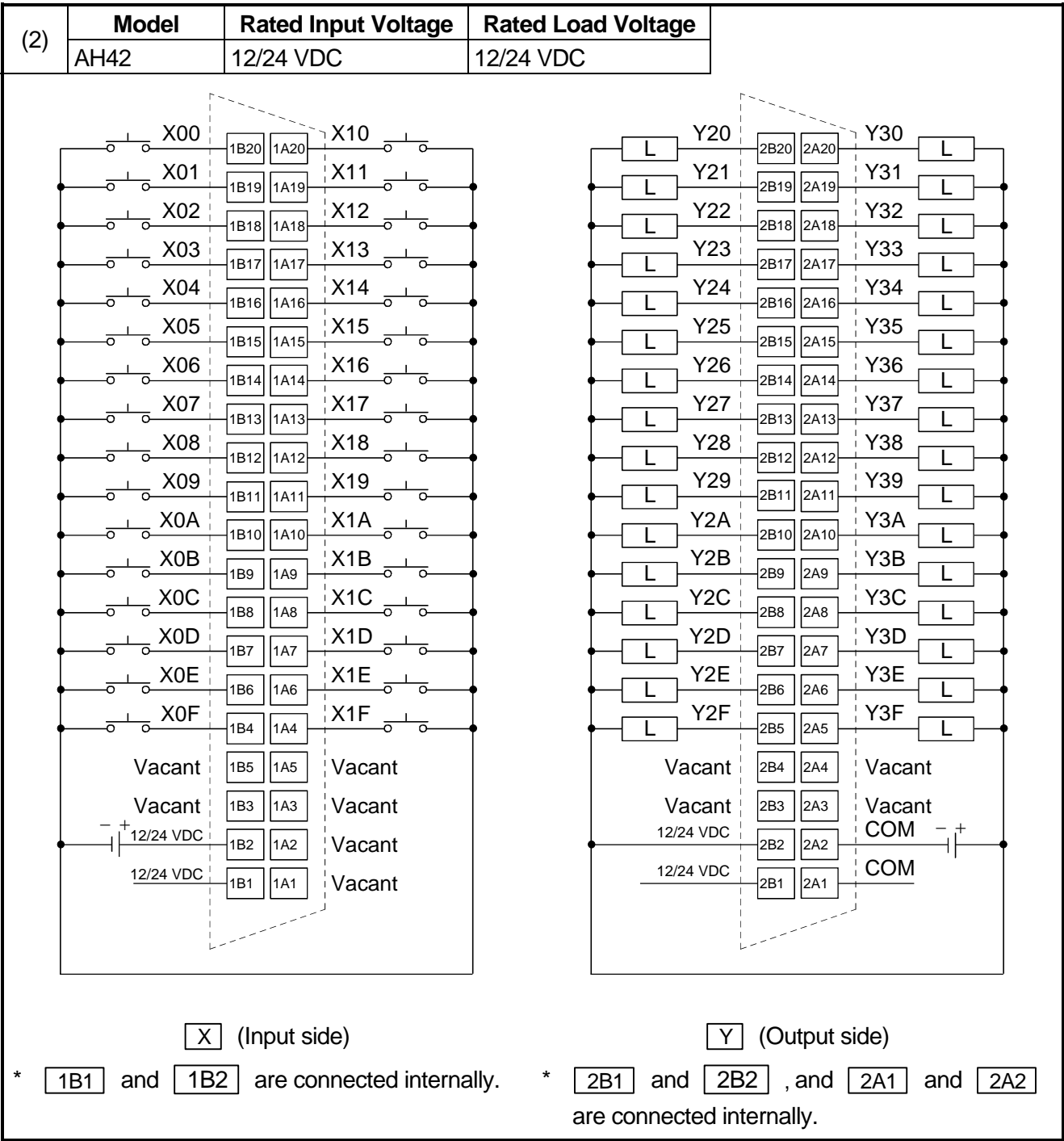
8A ○ ○ 8B

Seen from front face of the module

| Pin No. | Signal Name | Pin No. | Signal Name |
|---------|-------------|---------|-------------|
| 1A | XD0 | 1B | XD1 |
| 2A | XD2 | 2B | XD3 |
| 3A | XD4 | 3B | XD5 |
| 4A | XD6 | 4B | XD7 |
| 5A | XSCN0 | 5B | XSCN1 |
| 6A | XSCN2 | 6B | XSCN3 |
| 7A | XSCN4 | 7B | XSCN5 |
| 8A | XSCN6 | 8B | XSCN7 |

* If there will be cases where two or more switches are pressed simultaneously, install a diode at each switch (see right)





❖ 6. ERROR CODE ❖

When a programmable controller error occurs at power ON, when switched to the RUN status, or during the RUN status, the self-diagnosis function displays the error content (by LED indicator, or message display), and stores the error information at a special replay (SM) and special register (SD).

QnACPU errors and corrective actions are described in this chapter.

REMARK

The error code of the error that occurred when a general data processing request is made from the peripheral device, special function module or network system is not stored into SD0 of the QnACPU.

The error code is returned to the source of the general data processing request.

6.1 Error Code Readout Procedure

When an error occurs, the error code or error message, etc., can be read out at GPP function. For details regarding the GPP function operation procedure, refer to the GX Developer OPERATING MANUAL or SW-IVD-GPPQ OPERATING MANUAL.

6.2 Error Code List

The following information deals with error codes and the meanings, causes, and corrective measures of error messages.

"○" in the Corresponding CPU column indicates that the error is applied to all types of CPUs. "Rem" indicates compatibility with the remote I/O module. A CPU type name in the column indicates that the error is applied only to the specific CPU type.

| Error Code (SD0)*1 | Error Messages | Common Information (SD5 to 15)*1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|-----------------------|--------------------|--|--|------------|----------------|---------------------------------|--|--|
| | | | | RUN | ERROR | | | |
| 1000 | MAIN CPU DOWN | _____ | _____ | Off | Flicker/ On | Stop | Always | |
| 1001 | | | | Off | Flicker | Stop | Always | |
| 1002 | | | | | | | | |
| 1003 | | | | | | | | |
| 1004 | | | | | | | | |
| 1005 | | | | | | | | |
| 1006 | | | | | | | | |
| 1007 | | | | | | | | |
| 1008 | | | | | | | | |
| 1009 | | | | | | | | |
| 1010 | END NOT EXECUTE | _____ | _____ | Off | Flicker | Stop | When an END instruction is executed. | |
| 1011 | | | | | | | | |
| 1012 | | | | | | | | |
| 1101 | RAM ERROR | _____ | _____ | Off | Flicker | Stop | At power ON/At reset | |
| 1102 | | | | | | | | |
| 1103 | | | | | | | | |
| 1104 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

*2 The CPU MODULE operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

| | Error Code (SD0) *1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|---------------------|--|---|---------------------------|
| | 1000 | Run mode suspended or failure of main CPU (1) Malfunctioning due to noise or other reason (2) Hardware fault | <ul style="list-style-type: none"> • Measure noise level. • Reset the CPU module and RUN it again. If the same error is displayed again, this suggests a CPU module hardware error. Contact your nearest Mitsubishi representative. | ○ |
| | 1001 | | | QCPU |
| | 1002 | | | |
| | 1003 | | | QCPU Rem |
| | 1004 | | | |
| | 1005 | | | QCPU |
| | 1006 | | | |
| | 1007 | | | |
| | 1008 | | | |
| | 1009 | The fault of the power supply module, CPU module, main base unit, extension base unit or extension cable was detected. | Reset the CPU module and RUN it again. If the same error is displayed again, the power supply module, CPU module, main base unit, extension base unit or extension cable is faulty. Contact your nearest Mitsubishi representative. | Serial No. 04101 or later |
| | 1010 | Entire program was executed without the execution of an END instruction. (1) When the END instruction is executed it is read as another instruction code, e.g. due to noise. (2) The END instruction has been changed to another instruction code somehow. | <ul style="list-style-type: none"> • Measure noise level. • Reset the CPU module and RUN it again. If the same error is displayed again, this suggests a CPU module hardware error. Contact your nearest Mitsubishi representative. | ○ |
| | 1011 | | | |
| | 1012 | | | |
| | 1101 | Error in internal RAM/program memory where CPU module sequence program is stored. | This suggests a CPU module hardware error. Contact your nearest Mitsubishi representative. | ○ |
| | 1102 | Error in RAM used as CPU module work area. | | |
| | 1103 | Internal CPU module device memory error. | | |
| | 1104 | RAM Address error in the CPU module. | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) * 1 | Error Messages | Common Information (SD5 to 15) * 1 | Individual Information (SD16 to 26) * 1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|-------------------------|-------------------------|--|---|------------|----------------|---------------------------------|--|--|
| | | | | RUN | ERROR | | | |
| 1105 | RAM ERROR | _____ | _____ | Off | Flicker | Stop | At power ON/At reset | |
| 1200 | OPE. CIRCUIT ERR. | _____ | _____ | Off | Flicker | Stop | At power ON/At reset | |
| 1201 | | | | | | | | |
| 1202 | | | | | | | | |
| 1203 | OPE. CIRCUIT ERR. | _____ | _____ | Off | Flicker | Stop | When an END instruction executed. | |
| 1204 | | | | | | | | |
| 1205 | | | | | | | | |
| 1206 | | | | | | | When instruction executed. | |
| 1300 | FUSE BREAK OFF | Unit No. | _____ | Off/ON | Flicker/ On | Stop/ Continue * 2 | When an END instruction is executed. | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

* 2 The CPU MODULE operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|-------------------------|---|--|-------------------------------|
| | 1105 | System RAM fault in the CPU module | This suggests a CPU module hardware error. Contact your nearest Mitsubishi representative. | Q4AR |
| | | CPU shared memory fault in the CPU module | <ul style="list-style-type: none"> • Measure noise level. • Reset the CPU module and RUN it again. If the same error is displayed again, this suggests a CPU module hardware error. Contact your nearest Mitsubishi representative. | QCPU function Ver. B or later |
| | 1200 | The circuit that performs CPU internal index is not operating properly. | This suggests a CPU module hardware error. Contact your nearest Mitsubishi representative. | ○ |
| | 1201 | Internal CPU module hardware (logic) does not operate normally. | | |
| | 1202 | The circuit that executes sequence processing in the CPU module does not operate properly. | | |
| | 1203 | The operation circuit that conducts index modification in the CPU module is not operating properly. | This suggests a CPU module hardware error. Contact your nearest Mitsubishi representative. | Q4AR |
| | 1204 | The hardware (logic) in the CPU is not operating properly. | | |
| | 1205 | The operation circuit that conducts sequence processing in the CPU is not operating properly. | | |
| | 1206 | The DSP operation circuit in the CPU is not operating properly. | | |
| | 1300 | There is an output module with a blown fuse. | <ul style="list-style-type: none"> • Check FUSE. LED of the output modules and replace the module whose LED is lit. • Read the common information of the error using the peripheral device and replace the fuse at the output module corresponding to the numerical value (module No.) reading. Alternatively, monitor special registers SD1300 to SD1331 with the peripheral device and change the fuse of the output module whose bit has a value of "1". • When a display device is connected to the main base unit or extension base unit, check the connection status of the extension cable and the earth status of the display device. | QCPU Rem |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) * 1 | Error Messages | Common Information (SD5 to 15) * 1 | Individual Information (SD16 to 26) * 1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|-------------------------|----------------------|--|---|------------|----------------|---------------------------------|--|--|
| | | | | RUN | ERROR | | | |
| 1300 | FUSE BREAK OFF | Unit No. | ——— | Off/ON | Flicker/ On | Stop/ Continue * 2 | When an END instruction is executed. | |
| 1310 | I/O INT ERROR | ——— | ——— | Off | Flicker | Stop | During interrupt | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

* 2 The CPU MODULE operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|-------------------------|--|--|-------------------|
| | 1300 | There is an output module with a blown fuse. | <ul style="list-style-type: none"> • Check ERR. LED of the output modules and replace the fuse of the module whose LED is lit. • Read the common information of the error using the peripheral device and replace the fuse at the output module corresponding to the numerical value (module No.) reading. Alternatively, monitor special registers SD1300 to SD1331 with the peripheral device and change the fuse of the output module whose bit has a value of "1". • When a display device is connected to the main base unit or extension base unit, check the connection status of the extension cable and the earth status of the display device. | QnA Q4AR |
| | | (1) There is an output module with a blown fuse. (2) External power supply for output load is turned off or disconnected. | <ul style="list-style-type: none"> • Check ERR. LED of the output modules and replace the module whose LED is lit. • Read the common information of the error using the peripheral device and replace the fuse at the output module corresponding to the numerical value (module No.) reading. Alternatively, monitor special registers SD1300 to SD1331 with the peripheral device and change the fuse of the output module whose bit has a value of "1". • Check whether the external power supply for output load is ON or OFF. • When a display device is connected to the main base unit or extension base unit, check the connection status of the extension cable and the earth status of the display device. | Q2AS |
| | 1310 | An interruption has occurred although there is no interrupt module. | One of the individual modules is experiencing hardware problems, so check the modules. Contact your nearest Mitsubishi representative and explain the problem with the defective module. | ○ |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|----------------------|---|--|------------|----------------|---------------------------------|--|--|
| | | | | RUN | ERROR | | | |
| 1401 | SP. UNIT DOWN | Unit No. | ——— | Off/On | Flicker/ On | Stop/ Continue | At power ON/At reset/ When intelligent function module is accessed. | |
| 1402 | SP. UNIT DOWN | Unit No. | Program error location | Off/On | Flicker/ On | Stop/ Continue *6 | When an intelligent function module access instruction is executed. | |
| 1403 | | | ——— | | | | During execution of FROM/TO instruction set. | |
| 1411 | CONTROL -BUS ERR. | Unit No. | ——— | Off | Flicker | Stop | At power ON/At reset | |
| 1412 | | | Program error location | | | | During execution of FROM/TO instruction set. | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

*6 Stop/continue operation is selectable for each module by setting parameters.

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|-------------------------|---|--|-------------------|
| | 1401 | (1) There was no response from the intelligent function module during initial communication stage. (2) The size of the buffer memory of the intelligent function module is wrong. | This suggests a CPU module hardware error. Contact your nearest Mitsubishi representative. | QCPU Rem |
| | | When parameter I/O allocation was being made, there was no return signal from the special function module during initial processing stage. When error is generated, the head I/O number of the special function module that corresponds to the common information is stored. | The special function module that was being accessed is experiencing hardware error. Contact your nearest Mitsubishi representative. | QnA |
| | 1402 | The intelligent function module was accessed in the program, but there was no response. | This suggests a CPU module hardware error. Contact your nearest Mitsubishi representative. | QCPU Rem |
| | | The special function module was accessed during the execution of a FROM/TO instruction set, but there was no response. When an error is generated, the program error location corresponding to the individual information is stored. | The special function module that was being accessed is experiencing hardware error. Contact your nearest Mitsubishi representative. | QnA |
| | 1403 | (1) There was no response from the intelligent function module when the END instruction is executed. (2) An error is detected at the intelligent function module. | The intelligent function module that was being accessed is experiencing hardware error. Contact your nearest Mitsubishi representative. | QCPU Rem |
| | 1411 | When performing a parameter I/O allocation a special function module could not be accessed during initial communications. On error occurring, the head I/O number of the corresponding special function module is stored in the common information. | Reset the CPU module and RUN it again. If the same error is displayed again, the intelligent function module/special function module, CPU module or base unit is faulty. Contact your nearest Mitsubishi representative. | ○ Rem |
| | 1412 | The FROM/TO instruction set could not be executed, due to a system bus error with a special function module. On error occurring, the program error location is stored in the individual information. | | ○ |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) * 1 | Error Messages | Common Information (SD5 to 15) * 1 | Individual Information (SD16 to 26) * 1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|-------------------------|--------------------------|--|---|------------|---------|---------------------------------|--|--|
| | | | | RUN | ERROR | | | |
| 1413 | CONTROL -BUS. ERR. | _____ | _____ | Off | Flicker | Stop | Always | |
| 1414 | CONTROL -BUS. ERR. | Unit No. _____ | _____ | Off | Flicker | Stop | When an END instruction is executed. | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|-------------------------|--|---|-------------------------------|
| | 1413 | In a multiple CPU system configuration, the High Performance model QCPU of function version A was mounted. | <ul style="list-style-type: none"> Remove the High Performance model QCPU of function version A from the main base unit. Alternatively, replace the High Performance model QCPU of function version A with the High Performance model QCPU of function version B. Alternatively, replace the High Performance model QCPU of function version A with the High Performance model QCPU of function version B. An intelligent function module, CPU module or the base unit is experiencing error. Contact your nearest Mitsubishi representative. | QCPU function Ver. B or later |
| | | An error is detected on the system bus. (1) Self-diagnosis error of the system bus. (2) Self-diagnosis error of the CPU module | Reset the CPU module and RUN it again. If the same error is displayed again, the intelligent function module, CPU module or base unit is faulty. Contact your nearest Mitsubishi representative. | QCPU Rem |
| | 1414 | (1) Fault of the loaded module was detected. (2) In a multiple PLC system configuration, the High Performance model QCPU of function version A was mounted. | <ul style="list-style-type: none"> Remove the High Performance model QCPU of function version A from the main base unit. Alternatively, replace the High Performance model QCPU of function version A with the High Performance model QCPU of function version B. Alternatively, replace the High Performance model QCPU of function version A with the High Performance model QCPU of function version B. Reset the CPU module and RUN it again. If the same error is displayed again, the intelligent function module, CPU module or base unit is faulty. Contact your nearest Mitsubishi representative. | QCPU function Ver. B or later |
| | | An error is detected on the system bus. | A special function module, the CPU module, or base unit is experiencing error. Contact your nearest Mitsubishi representative. | QCPU Rem |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|--------------------------|---|--|-------------------|---------|---------------------------------|---|--|
| | | | | RUN | ERROR | | | |
| 1415 | CONTROL -BUS. ERR. | Base No. | _____ | Off | Flicker | Stop | When an END instruction is executed | |
| 1416 | | Unit No. | | | | | At power ON/At reset | |
| 1421 | SYS. UNIT DOWN *3 | _____ | _____ | Off | Flicker | Stop | Always | |
| 1500 | AC/DC DOWN | _____ | _____ | On | Off | Continue | Always | |
| 1510 | DUAL DC DOWN 5V *4 | _____ | _____ | On | On | Continue | Always | |
| 1520 | DC DOWN 5V *5 | _____ | _____ | Off | Flicker | Stop | Always | |
| 1530 | DC DOWN 24V *3 | _____ | _____ | On | On | Continue | Always | |
| 1600 | BATTERY ERROR | Drive Name | _____ | On | On | Continue | Always | |
| 1601 | | | | ----- | | | | |
| 1602 | | | | BAT.ALM LED On | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

*3 This can only be detected in redundant systems. Detection is possible in either the control system or the standby system.

*4 This can only be detected in the redundant system control system.

*5 This can be detected in either a standalone system or a redundant system. However, in a redundant system it can only be detected in the control system.

| | Error Code (SD0) *1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|---------------------|---|--|-------------------------------|
| | 1415 | Fault of the main or extension base unit was detected. | An intelligent function module, the CPU module, or the base unit is experiencing error. Contact your nearest Mitsubishi representative. | QCPU function Ver. B or later |
| | 1416 | System bus fault was detected at PLC power-on or CPU module reset. | | |
| | 1421 | Hardware fault at the system management module AS92R. | <ul style="list-style-type: none"> Since it suggests the hardware fault of the system management module AS92R Contact your nearest Mitsubishi representative. | Q4AR |
| | 1500 | (1) A momentary power supply interruption has occurred. (2) The power supply went off. | Check the power supply. | ○ Rem |
| | 1510 | The power supply voltage (100 - 240VAC) of either of the two power supply modules on the power supply duplexing extension base unit dropped to or below 85% of the rated voltage. | Check the supply voltage of the power supply module. If the voltage is abnormal then replace the power supply module. | Q4AR |
| | 1520 | The power supply voltage(100 - 240VAC) of the power supply module on the extension base unit dropped to or below 85% of the rated voltage. | | |
| | 1530 | The 24 VDC power supplied to the system management module AS92R has dropped below 90% of the rated voltage. | Check the 24VDC power supplied to the system management module AS92R. | |
| | 1600 | (1) Voltage in the CPU module battery has dropped below stipulated level. (2) The CPU module battery is not connected. | <ul style="list-style-type: none"> Change the battery. If the battery is for program memory, standard RAM or for the back-up power function, install a lead connector. | ○ |
| | 1601 | Voltage of the battery on memory card 1 has dropped below stipulated level. | Change the battery. | |
| | 1602 | Voltage of the battery on memory card 2 has dropped below stipulated level. | Change the battery. | QnA |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|------------------------|---|--|------------|----------------|---------------------------------|--|--|
| | | | | RUN | ERROR | | | |
| 2000 | UNIT VERIFY ERR. | Unit No. | —— | Off/On | Flicker/ On | Stop/ Continue *2 | When an END instruction is executed. | |
| 2100 | SP. UNIT LAY ERR. | Unit No. | —— | Off | Flicker | Stop | At power ON/At reset | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

*2 The CPU MODULE operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|----------------------|--|--|-------------------------------|
| | 2000 | The High Performance model QCPU of function version A was loaded in a multiple CPU system configuration. | Change the High Performance model QCPU of function version A for the High Performance model QCPU of function version B. | QCPU function Ver. B or later |
| | | I/O module information power ON is changed. • I/O module (or special function module) not installed properly or installed on the base unit. | <ul style="list-style-type: none"> • Read the common information of the error using the peripheral device, and check and/or change the module that corresponds to the numerical value (module number) there. • Alternatively, monitor the special registers SD1400 to SD1431 at a peripheral device, and change the fuse at the output module whose bit has a value of "1". • When a display device is connected to the main base unit or extension base unit, check the connection status of the extension cable and the earth status of the display device. | ○ Rem |
| | 2100 | Slot loaded with the QI60 is set to other than the Inteli (intelligent function module) or Interrupt (interrupt module) in the parameter I/O assignment. | Make setting again to match the parameter I/O assignment with the actual loading status. | QCPU function Ver. B or later |
| | | (1) In the parameter I/O allocation settings, an Inteli (intelligent function module) was allocated to a location reserved for an I/O module or vice versa. (2) In the parameter I/O allocation settings, a module other than CPU (or nothing) was allocated to a location reserved for a CPU module or vice versa. (3) A general-purpose switch was set to the module with no general-purpose switches. | <ul style="list-style-type: none"> • Reset the parameter I/O allocation setting to conform to the actual status of the intelligent function module and the CPU module. • Delete the general-purpose switch settings. | QCPU Rem |
| | | In parameter I/O allocation settings, a special function module was allocated to a location reserved for an I/O module. Or, the opposite has happened. | Reset the parameter I/O allocation setting to conform with the actual status of the special function modules. | QnA |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) * 1 | Error Messages | Common Information (SD5 to 15) * 1 | Individual Information (SD16 to 26) * 1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|-------------------------|----------------------|--|---|------------|---------|---------------------------------|-------------------------|--|
| | | | | RUN | ERROR | | | |
| 2101 | SP. UNIT LAY ERR. | Unit No. | ——— | Off | Flicker | Stop | At power ON/At reset | |
| 2102 | | | | | | | | |
| 2103 | SP. UNIT LAY ERR. | Unit No. | ——— | Off | Flicker | Stop | At power ON/At reset | |
| 2104 | | | | | | | | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

| | Error Code (SD0) *1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|------------------------|--|---|--|
| | 2101 | 13 or more A-series special function modules (except for the A1SI61) that can initiate an interrupt to the CPU module have been installed. | Reduce the A series special function modules (except the A1SI61) that can make an interrupt start to the CPU module to 12 or less. | QCPU |
| | | 13 or more special function modules (not counting the A(1S)I61) capable of sending an interrupt to the CPU module have been installed. | Keep the number of special function modules that can initiate an interrupt (with the exception of the A(1S)I61 module) to 12 or fewer. | QnA |
| | 2102 | 7 or more A1SD51S have been installed. | Keep the number of A1SD51S to 6 or fewer. | QCPU |
| | | 7 or more serial communication modules (excludes A (1S) J71QC24) have been installed. | Keep the number of serial communication modules (excludes A(1S)J71QU24) installed to 6 or fewer. | QnA Rem |
| | 2103 | (1) 2 or more QI60/A1SI61 modules are loaded in a single CPU system. (2) 2 or more QI60/A1SI61 modules are set to the same control CPU in a multiple CPU system. (3) 2 or more A1SI61 modules are loaded in a multiple CPU system. | <ul style="list-style-type: none"> • Reduce the number of QI60/A1SI61 modules loaded in the single CPU system to one. • Change the number of QI60/A1SI61 modules set to the same control CPU to only one in the multiple CPU system. • Reduce the number of A1SI61 modules to only one in the multiple CPU system. When using an interrupt module with each QCPU in a multiple CPU system, change it for the QI60. (Use one A1SI61 module + max. three QI60 modules or only the QI60 modules.) | QCPU function Ver. B or later |
| | | 2 or more QI60, A1SI61 interrupt modules have been installed. | Install only 1 QI60, A(1S)I61 module. | QCPU |
| | | The QI60 is loaded. | Remove the QI60. | Rem |
| | | 2 or more A1SI61 interrupt modules have been installed. | Install only 1 AI61 module. | QnA |
| | 2104 | At the MELSECNET/MINI auto refresh parameter settings, the module allocation that was set is different from the actual module models at the station numbers in the link system. | Reset the parameter MELSECNET/MINI auto refresh unit module allocation setting so that it conforms to the station number of the module that is actually linked. | QnA |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|----------------------|---|--|------------|---------|---------------------------------|-------------------------|--|
| | | | | RUN | ERROR | | | |
| 2105 | SP. UNIT LAY ERR. | Unit No. | ——— | Off | Flicker | Stop | At power ON/At reset | |
| 2106 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|-------------------------|--|--|-------------------------------|
| | 2105 | <p>There are too many special function modules that can use dedicated instructions allocated (number of modules installed). (The total of the figures indicated below is above 1344.)</p> <p>(Number of AD59 modules installed × 5) (Number of AD57 (S1)/AD58 modules installed × 8) (Number of AJ71C24 (S3/S6/S8) modules installed × 10) (Number of AJ71UC24 modules installed × 10) (Number of AJ71C21 (S1) modules installed × 29) (Number of AJ71PT32-S3/AJ71T32-S3 modules installed × 125) * (Number of AJ71QC24 (R2, R4) modules installed × 29) (Number of AJ71ID1 (2)-R4 modules installed × 8) (Number of AD75 modules installed × 12)</p> <hr/> <p>Total > 1344</p> | <p>Reduce the number of special function modules installed. *: When the expansion mode is used.</p> | QnA |
| | 2106 | <p>(1) 5 or more MELSECNET/H modules are loaded in a whole multiple CPU system. (2) 5 or more Q series Ethernet interface modules are loaded in a whole multiple CPU system.</p> | <ul style="list-style-type: none"> • Reduce the MELSECNET/H modules to 4 or less in the whole multiple CPU system. • Reduce the Q series Ethernet modules to 4 or less in the whole multiple CPU system. | QCPU function Ver. B or later |
| | | <p>(1) 5 or more MELSECNET/H modules have been installed. (2) 5 or more Q series Ethernet interface modules have been installed. (3) The same network numbers or station numbers exist, in the MELSECNET/10 network system.</p> | <ul style="list-style-type: none"> • Reduce the MELSECNET/H modules to 4 or less. • Reduce the Q series Ethernet modules to 4 or less. • Check the network numbers and station numbers. | QCPU Rem |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|----------------------|---|--|------------|---------|---------------------------------|-------------------------|--|
| | | | | RUN | ERROR | | | |
| 2106 | SP. UNIT LAY ERR. | Unit No. | ——— | Off | Flicker | Stop | At power ON/At reset | |
| 2107 | | | | | | | | |
| 2108 | | | | | | | | |
| 2109*6 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

*6 Stop/continue operation is selectable for each module by setting parameters.

| | Error Code (SD0) *1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|------------------------|--|--|-------------------|
| | 2106 | (1) 5 or more AJ71QLP21 & AJ71QBR11 modules are installed. (2) 3 or more AJ71AP21/R21 & AJ71AT21B modules are installed. (3) The total number of installed AJ71QLP21, AJ71QBR11, AJ71AP21/R21, and AJ71AT21B modules exceeds 5. (4) The same network numbers or identical station numbers exist in the MELSECNET/10 network system. (5) 2 or more master or load stations exist simultaneously at the MELSECNET(II) or MELSECNET/B data link system. | <ul style="list-style-type: none"> • Reduce the AJ71QLP21 and AJ71QBR11 modules to 4 or less. • Reduce the AJ71AP21/R21 and AJ71AT21B modules to 2 or less. • Reduce the AJ71QLP21, AJ71QBR11, AJ71AP21/R21 and AJ71AT21B modules to a total of 4 or less. • Check the network Nos. and station Nos. • Check the station Nos. | QnA |
| | 2107 | Head X/Y set in the parameter I/O allocation settings is also the head X/Y for another module. | Reset the parameter I/O allocation setting to conform with the actual status of the special function modules. | ○ Rem |
| | 2108 | (1) Network module A1SJ71LP21, A1SJ71BR11, A1SJ71AP21, A1SJ71AR21, or A1SJ71AT2B dedicated for the A2USCPU has been installed. (2) Network module A1SJ71QLP21 or A1SJ71QBR11 dedicated for the Q2AS has been installed. | Change network module to MELSECNET/H module. | QCPU |
| | | A(1S)J71LP21 or A(1S)J71BR11 for use with the AnUCPU network module has been installed. | Change network module to A(1S)J71QLP21 or A(1S)J71QBR11. | QnA |
| | 2109 | The control system and standby system module configurations are different when a redundant system is in the backup mode. | Check the module configuration of the standby system. | Q4AR |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|-------------------|---|--|------------|----------------|---------------------------------|---|--|
| | | | | RUN | ERROR | | | |
| 2110 | SP. UNIT ERROR | Unit No. | Program error location | Off/On | Flicker/ On | Stop/ Continue *2 | When instruction executed. | |
| 2111 | SP. UNIT ERROR | Unit No. | Program error location | Off/On | Flicker/ On | Stop/ Continue *2 | When instruction executed. | |
| 2112 | SP. UNIT ERROR | Unit No. | Program error location | Off/On | Flicker/ On | Stop/ Continue *2 | When instruction executed/ STOP → RUN | |
| 2113 | | FFFF _H (fixed) | | | | | | |
| 2114 | SP. UNIT ERROR | Unit No. | Program error location | Off/On | Flicker/ On | Continue/ Stop | When instruction is executed | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

*2 The CPU MODULE operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

| | Error Code (SD0) *1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|------------------------|--|---|-------------------------------|
| | 2110 | Station not loaded was specified using the instruction whose target was the CPU share memory. | Read the individual information of the error using the peripheral device, check the program corresponding that value (program error location), and make correction. | QCPU function Ver. B or later |
| | | (1) The location designated by the FROM/TO instruction set is not a special function module. (2) The special function module, Network module being accessed is faulty. | <ul style="list-style-type: none"> • Read the individual information of the error using the peripheral device, then check and edit the FROM/TO instruction set that corresponds to the numerical value there (Program error location). • The special function module that is being accessed has a hardware error. Consult your nearest Mitsubishi representative. | ○ |
| | 2111 | The location designated by a link direct device (J□¥□) is not a network module. | <ul style="list-style-type: none"> • Read the individual information of, then check and edit the FROM/TO instruction set that corresponds to the numerical value there (Program error location). • The special function module that is being accessed has a hardware error. Consult your nearest Mitsubishi representative. | ○ |
| | 2112 | (1) The module specified in the special function module dedicated instruction is not a special function module. Alternatively, it is not the corresponding special function module. (2) The network No. specified in the network dedicated instruction does not exist, or the relay target network does not exist. (3) Alternatively, it is not the relevant special function module. | Read individual information of the error using the peripheral device, then check and edit the special function module (Network module) dedicated instruction that corresponds to the numerical value there (program error location). | ○ Rem |
| | 2113 | The one specified in the network-dedicated instruction is not a network module. | | ○ |
| | 2114 | An instruction, which on execution specifies other stations, has been used for specifying the host CPU. (An instruction that does not allow the host CPU to be specified). | Read the individual information of the error using the peripheral device, check the program corresponding that value (program error location), and make correction. | QCPU function Ver. B or later |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|----------------------|---|--|------------|----------------|---------------------------------|------------------------------------|--|
| | | | | RUN | ERROR | | | |
| 2115 | SP. UNIT ERROR | Unit No. | Program error location | Off/On | Flicker/ On | Continue/ Stop | When instruction is executed | |
| 2116 | | | | | | | | |
| 2117 | | | | | | | | |
| 2120 | SP. UNIT LAY ERR. | ——— | ——— | Off | Flicker | Stop | At power ON/At reset | |
| 2121 | | | | | | | | |
| 2122 | | | | | | | | |
| 2124 | | | | | | | | |
| 2125 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

| | Error Code (SD0) *1 | Error Contents and Cause | Corrective Action | Corres- ponding CPU |
|--|------------------------|---|---|--|
| | 2115 | An instruction, which on execution specifies the host CPU, has been used for specifying other CPUs. (An instruction that does not allow other stations to be specified). | Read the individual information of the error using the peripheral device, check the program corresponding that value (program error location), and make correction. | QCPU function Ver. B or later |
| | 2116 | (1) An instruction that does not allow the under the control of another CPU to be specified is being used for a similar task. (2) Instruction was executed for the A or QnA module under control of another CPU. | | |
| | 2117 | A CPU module that cannot be specified in the instruction dedicated to the multiple CPU system was specified. | | |
| | 2120 | The location of Q□B and QA1S□B is improper. | Check the location of the base unit. | QCPU Rem |
| | 2121 | The CPU module is installed at other than the CPU slot or slots 0 to 2. | Check the loading position of the CPU module and reinstall it at the correct slot. | |
| | 2122 | QA1S□B is used to the main base unit. | Use Q3□B as the main base unit. | |
| | 2124 | (1) A module is installed at 65th or higher slot. (2) A module is installed at the slot later than the number of slots specified with base allocation setting. (3) A module is installed at the I/O points later than the 4,096th point. (4) A module installed at the 4,096th point occupies higher points. | <ul style="list-style-type: none">• Remove the module installed at 65th or later slot.• Remove the module installed at the slot later than the number of slots specified with base allocation setting.• Remove the module installed at the I/O points later than the 4,096th point.• Change the last module to a module which does not exceed the 4,096th point. | |
| | 2125 | (1) A module which the QCPU cannot recognise has been installed. (2) There was no response form the intelligent function module. | <ul style="list-style-type: none">• Install a module which can be used with the CPU module.• The intelligent function module is experiencing hardware problems. Contact your nearest Mitsubishi representative. | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|-----------------------|---|--|------------|----------------|---------------------------------|---|--|
| | | | | RUN | ERROR | | | |
| 2126 | SP. UNIT LAY ERR. | Unit No. | ——— | Off | Flicker | Stop | At power ON/At reset | |
| 2150 | SP. UNIT VER. ERR. | Unit No. | ——— | Off | Flicker | Stop | At power ON/At reset | |
| 2200 | MISSING PARA. | File name/ drive name | ——— | Off | Flicker | Stop | At power ON/At reset | |
| 2210 | BOOT ERROR | File name/ drive name | ——— | Off | Flicker | Stop | At power ON/At reset | |
| 2300 | ICM. OPE. ERROR | File name/ drive name | ——— | Off/On | Flicker/ On | Stop/ Continue *2 | When memory card is inserted or removed | |
| 2301 | ICM. OPE. ERROR | File name/ drive name | ——— | Off/On | Flicker/ On | Stop/ Continue *2 | When memory card is inserted or removed | |
| 2302 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

*2 The CPU operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|-------------------------|--|---|-------------------------------|
| | 2126 | CPU module locations in a multiple CPU system are either of the following. (1) There are empty slots between the QCPU and QCPU/motion controller. (2) A module other than the High Performance model QCPU/Process CPU (including the motion controller) is mounted on the left-hand side of the High Performance model QCPU/Process CPU. | <ul style="list-style-type: none"> • Eliminate empty slots between the CPU modules. (Set empty slots on the right side of the CPU modules.) • Dismount the module other than the QCPU mounted between the High Performance model QCPUs/Process CPUs and replace it with the High Performance model QCPU/Process CPU. Load the motion controller on the right side of the QCPUs. | QCPU function Ver. B or later |
| | 2150 | In a multiple CPU system, the control CPU of the intelligent function module incompatible with the multiple CPU system is set to other than CPU No.1. | <ul style="list-style-type: none"> • Change the intelligent function module for the one compatible with the multiple CPU system (function version B). • Change the setting of the control CPU of the intelligent function module incompatible with the multiple CPU system to CPU No.1. | |
| | 2200 | There is no parameter file at the drive designated by DIP switches as a valid drive. | <ul style="list-style-type: none"> • Check and correct the setting of the parameter enabled drive switch. • Put a parameter file in the drive designated by the parameter enabled drive switch. | ○ |
| | 2210 | The contents of the boot file are incorrect. | Check the boot setting. | QCPU |
| | | There is no boot file in the drive designated by the parameter enabled drive switch even though the Boot DIP switch is ON. | <ul style="list-style-type: none"> • Check and correct the setting of the parameter enabled drive switch. • Put a boot file in the drive designated by the parameter enabled drive switch. | QnA |
| | 2300 | (1) A memory card was removed without switching the memory card in/out switch OFF. (2) The memory card in/out switch is turned ON although a memory card is not actually installed. | <ul style="list-style-type: none"> • Remove memory card after placing the memory card in/out switch OFF. • Turn on the card insert switch after inserting a memory card. | ○ |
| | 2301 | (1) The memory card has not been formatted. (2) Memory card format status is incorrect. | <ul style="list-style-type: none"> • Format memory card. • Reformat memory card. • Check memory card. | ○ |
| | 2302 | A memory card that cannot be used with the CPU module has been installed. | | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15)*1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|-------------------|--|--|------------|---------|---------------------------------|-------------------------|--|
| | | | | RUN | ERROR | | | |
| 2400 | FILE SET ERROR | File name/ drive name | Parameter number | Off | Flicker | Stop | At power ON/At reset | |
| 2401 | FILE SET ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | At power ON/At reset | |
| 2402 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

| | Error Code (SD0) *1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|------------------------|---|---|-------------------------------|
| | 2400 | Automatic write to standard ROM was performed on the CPU module that is incompatible with automatic write to standard ROM. (Memory card where automatic write to standard ROM was selected in the boot file was fitted and the parameter enable drive was set to the memory card.) | <ul style="list-style-type: none"> • Execute automatic write to standard ROM on the CPU module which is compatible with automatic write to standard ROM. • Using GX Developer, perform write of parameters and programs to standard ROM. • Change the memory card for the one where automatic write to standard ROM has not been set, and perform boot operation from the memory card. | QCPU function Ver. B or later |
| | | The file designated at the PLC file settings in the parameters cannot be found. | Read the individual information of the error using peripheral device, check to be sure that the parameter drive name and file name correspond to the numerical values there (parameter number), and correct. Create a file created using parameters, and load it to the CPU module. | ○ |
| | | The Ethernet parameter that was added for QnACPU, with the function version "B," has been set to QnACPU without the function version "B." | Change to QnACPU with the function version "B". Delete the Ethernet parameter. | QnA |
| | 2401 | Program memory capacity was exceeded by performing boot operation or automatic write to standard ROM. | <ul style="list-style-type: none"> • Check and correct the parameters (boot setting). • Delete unnecessary files in the program memory. • Choose "Clear program memory" for boot in the parameter so that boot is started after the program memory is cleared. | QCPU function Ver. B or later |
| | | The file designated at the parameter PLC RAS settings fault history area has not been created. | Read the individual information of the error using the peripheral device, check to be sure that the parameter drive name and file name correspond to the numerical values there (parameter number), and correct. Check the space remaining in the memory card. | ○ |
| | 2402 | Though the file register has been set in the pairing setting/tracking setting, the file register does not exist. | Confirm the file register and parameter. | Q4AR |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|--------------------|---|--|------------|----------------|---------------------------------|------------------------------------|--|
| | | | | RUN | ERROR | | | |
| 2410 | FILE OPE. ERROR | File name/drive name | Program error location | Off/On | Flicker/ ON | Stop/ Continue *2 | When instruction is executed | |
| 2411 | | | | | | | | |
| 2412 | | | | | | | | |
| 2413 | | | | | | | | |
| 2500 | CAN'T EXE. PRG. | File name/drive name | ——— | Off | Flicker | Stop | At power ON/At reset | |
| 2501 | | | | | | | | |
| 2502 | | | | | | | | |
| 2503 | | | | | | | | |
| 2504 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

*2 The CPU MODULE operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corres- ponding CPU |
|--|-------------------------|--|--|---------------------------|
| | 2410 | The specified program does not exist in the program memory. This error may occur when the ECALL, EFCALL, PSTOP, PSCAN, POFF or PLOW instruction is executed. | Read the individual information of the error using the peripheral device, check to be sure that the program corresponds to the numerical values there (program location), and correct. Create a file created using parameters, and load it to the CPU module. | ○ |
| | 2411 | The specified program exists in the program memory, but has not been registered in the program setting of the Parameter dialog box. This error may occur when the ECALL, EFCALL, PSTOP, PSCAN, POFF or PLOW instruction is executed. | Read the individual information of the error using the peripheral device, check to be sure that the program corresponds to the numerical values there (program location), and correct. | |
| | 2412 | The SFC program file is one that cannot be designated by the sequence program. | | |
| | 2413 | No data has been written to the file designated by the sequence program. | Read the individual information of the error using the peripheral device, check to be sure that the program corresponds to the numerical values there (program location), and correct. Check to ensure that the designated file has not been write protected. | |
| | 2500 | There is a program file that uses a device that exceeds the device allocation range designated by the parameter device settings. | Read the common information of the error using the peripheral device, check to be sure that the parameter device allocation setting and the program file device allocation correspond to the numerical values there (file name), and correct if necessary. | ○ |
| | 2501 | There are multiple program files although "none" has been set at the parameter program settings. | Edit the parameter program setting to "yes". Alternatively, delete unneeded programs. | |
| | 2502 | The program file is incorrect. Alternatively, the file contents are not those of a sequence program. | Check whether the program version is * *.QPG, and check the file contents to be sure they are for a sequence program. | ○ |
| | 2503 | There are no program files at all. | • Check program configuration. • Check parameters and program configuration. | |
| | 2504 | Two or more SFC normal programs or control programs have been designated. | | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|------------------------|---|--|------------|---------|---------------------------------|--|--|
| | | | | RUN | ERROR | | | |
| 3000 | PARAMET ER ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |
| 3001 | | | | | | | | |
| 3002 | | | | | | | | |
| 3003 | PARAMET ER ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | When an END instruction is executed. | |
| | PARAMET ER ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |
| 3004 | PARAMET ER ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

*2 The CPU operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|----------------------|--|---|-------------------------------|
| | 3000 | In a multiple CPU system, the intelligent function module under control of another CPU is specified in the interrupt pointer setting of the parameter. | <ul style="list-style-type: none"> Specify the head I/O number of the intelligent function module under control of the host CPU. Delete the interrupt pointer setting of the parameter. | QCPU function Ver. B or later |
| | | The parameter settings for timer time limit setting, the RUN-PAUSE contact, the common pointer number, the general data processing, number of vacant slots, or system interrupt settings are outside the range that can be used by the CPU module. | <ul style="list-style-type: none"> Read the detailed information of the error using the peripheral device, check the parameter items corresponding to the numerical values (parameter numbers) there, and correct when necessary. | ○ Rem |
| | 3001 | Parameter contents have been destroyed. | <ul style="list-style-type: none"> If the error is still generated following the correction of the parameter settings, it is likely that there is a memory error, either in the internal CPU RAM/program memory or on the memory card. Contact your nearest Mitsubishi representative. | ○ |
| | 3002 | When "use the following files" is selected for the file registers in the PLC file setting parameter, the specified file does not exist though the file register capacity has been set. | | |
| | 3003 | The automatic refresh range of the multiple CPU system exceeded the file register capacity. | Change the file register file for the one refresh-enabled in the whole range. | QCPU function Ver. B or later |
| | | The number of devices set at the parameter device settings exceeds the possible CPU module range. | <ul style="list-style-type: none"> Read the detailed information of the error using the peripheral device, check the parameter items corresponding to the numerical values (parameter numbers) there, and correct when necessary. If the error is still generated following the correction of the parameter settings, it is likely that there is a memory error, either in the internal CPU RAM/program memory or on the memory card. Contact your nearest Mitsubishi representative. | ○ |
| | 3004 | The parameter file is incorrect. Alternatively, the contents of the file are not parameters. | Check whether the parameter file version is *.QPA, and check the file contents to be sure they are parameters. | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|--------------------|---|--|------------|---------|---------------------------------|--|--|
| | | | | RUN | ERROR | | | |
| 3006 | PARAMETER ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |
| 3009 | | | | | | | | |
| 3010 | | | | | | | | |
| 3012 | | | | | | | | |
| 3013 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|-------------------------|---|---|--------------------------------|
| | 3006 | (1) The high speed interrupt parameter is set in a Q02CPU. (2) The high speed parameter is set in a multiple CPU system. (3) The high speed interrupt parameter is set when a QA1S□B or QA□B is used. (4) No module is installed at the I/O address designated by the high speed interrupt parameter. | <ul style="list-style-type: none"> • Delete the setting of the Q02CPU's high speed interrupt parameter. To use high speed interrupts, change the CPU module to one of the Q02H/Q06H/Q12H/Q25H CPU. • To use a multiple CPU system, delete the setting of the high-speed interrupt parameter. To use high speed interrupts, change the system to a single CPU system. • To use either the QA1S□B or QA□B, delete the setting of the high speed interrupt parameter. To use high speed interrupts, do not use the QA1S□B/QA□B. • Re-examine the I/O address designated by the high speed interrupt parameter. | QCPU serial No. 04012 or later |
| | 3009 | In a multiple CPU system, the modules for AnS, A, Q2AS and QnA have been set to multiple control CPUs. | Re-set the parameter I/O assignment to control them under one QCPU. (Change the parameters of all CPUs in the multiple CPU system.) | QCPU function Ver. B or later |
| | 3010 | The parameter-set number of CPU modules differs from the actual number in a multiple CPU system. | Match (preset count of multiple CPU setting) - (CPU (empty) setting in I/O assignment) with the actual number of CPUs loaded. | |
| | 3012 | Multiple CPU setting or control CPU setting differs from that of the reference CPU in a multiple CPU system. | Match the multiple CPU setting or control CPU setting in the parameter with that of the reference CPU (CPU No.1). | |
| | 3013 | Multiple CPU automatic refresh setting is any of the followings in a multiple CPU system. (1) When a bit device is specified as a refresh device, a number other than a multiple of 16 is specified for the refresh-starting device. (2) The device specified is other than the one that may be specified. (3) The number of send points is an odd number. | Check the following in the multiple CPU automatic refresh parameters and make correction. <ul style="list-style-type: none"> • When specifying the bit device, specify a multiple of 16 for the refresh starting device. • Specify the device that may be specified for the refresh device. • Set the number of send points to an even number. | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|------------------------|---|--|------------|---------|---------------------------------|--|--|
| | | | | RUN | ERROR | | | |
| 3100 | LINK PARA. ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|-------------------------|---|---|-------------------------------|
| | 3100 | In a multiple CPU system, the MELSECNET/H under control of another CPU is specified as the head I/O number in the network setting parameter of the MELSECNET/H. | <ul style="list-style-type: none"> Delete the MELSECNET/H network parameter of the MELSECNET/H under control of another CPU. Change the setting to the head I/O number of the MELSECNET/H under control of the host CPU. | QCPU function Ver. B or later |
| | | The network parameters of the MELSECNET/H operating in the ordinary station were rewritten to the control station, or the network parameters of the MELSECNET/H operating in the control station were rewritten to the ordinary station. (The network parameters are reflected on the module side by making a reset.) | Reset the CPU module. | |
| | | (1) The number of actually installed modules is different from that designated in the number of modules setting parameter of MELSECNET/H. (2) The head I/O number of actually installed modules is different from that designated in the network parameter of MELSECNET/H. (3) Some data in the parameter cannot be handled. (4) The station type of MELSECNET/H has been changed while the power is on. (RESET → RUN is required to change the station type.) | <ul style="list-style-type: none"> Check the network parameters and mounting status, and if they differ, match the network parameters and mounting status. If any network parameter has been corrected, write it to the CPU module. Confirm the setting of the number of extension stages of the extension base units. Check the connection status of the extension base units and connectors. When a display device is connected to the main base unit or extension base unit, check the connection status. If the error occurs after the above checks have been made, it suggests a hardware fault. Contact your nearest Mitsubishi representative. | QCPU |
| | | Although the QnACPU is a control station or master station, the network parameters have not been written. | <ul style="list-style-type: none"> Correct and write the network parameters. If the error occurs after correction, it suggests a hardware fault. Contact your nearest Mitsubishi representative. | QnA |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|------------------------|---|--|------------|---------|---------------------------------|--|--|
| | | | | RUN | ERROR | | | |
| 3101 | LINK PARA. ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | When an END instruction is executed. | |
| | LINK PARA. ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |
| 3102 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

| | Error Code (SD0) *1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|------------------------|--|---|-------------------------------|
| | | The link refresh range exceeded the file register capacity. | Change the file register file for the one that enables entire range refresh. | |
| | | (1) When the station number of the MELSECNET/H module is 0, the inter-PLC network parameter setting has been made. (2) When the station number of the MELSECNET/H module is other than 0, the remote master parameter setting has been made. | Correct the type or station number of the MELSECNET/H module in the parameter to meet the used system. | QCPU function Ver. B or later |
| | 3101 | (1) The network No. specified by a parameter is different from that of the actually mounted network. (2) The head I/O No. specified by a parameter is different from that of the actually mounted I/O unit. (3) The network class specified by a parameter is different from that of the actually mounted network. (4) The network refresh parameter of the MELSECNET/H, MELSECNET/10 is out of the specified area. | <ul style="list-style-type: none"> • Check the network parameters and mounting status, and if they differ, match the network parameters and mounting status. If any network parameter has been corrected, write it to the CPU module. • Confirm the setting of the number of extension stages of the extension base units. • Check the connection status of the extension base units and connectors. When a display device is connected to the main base unit or extension base unit, check the connection status. • If the error occurs after the above checks have been made, it suggests a hardware fault. Contact your nearest Mitsubishi representative. | ○ |
| | 3102 | An error was discovered when the network parameter check was made at the network module. The parameters specific to MELSECNET/H and MELSECNET/10 are not normal. | <ul style="list-style-type: none"> • Write after correcting network parameters. • If the error persists after corrections have been made, contact your nearest Mitsubishi representative. | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|------------------------|---|--|------------|---------|---------------------------------|--|--|
| | | | | RUN | ERROR | | | |
| 3103 | LINK PARA. ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |
| 3104 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|-------------------------|---|---|-------------------------------|
| | 3103 | In a multiple CPU system, the Q series Ethernet interface module under control of another station is specified as the head I/O number of the Ethernet setting parameter. | <ul style="list-style-type: none"> Delete the Ethernet setting parameter of the Q series Ethernet interface module under control of another station. Change the setting to the head I/O number of the Q series Ethernet interface module under control of the host station. | QCPU function Ver. B or later |
| | | (1) Though the number of Ethernet module is set to one or more in the parameter, the actually mounted number of units is zero. (2) The head I/O number for the Ethernet module set parameter is different from that of the actually mounted module. | <ul style="list-style-type: none"> Write after correcting network parameters. If the error persists after corrections have been made, contact your nearest Mitsubishi representative. | ○ Rem |
| | | (1) AJ71QE71 does not exist in the position of I/O number set by the parameter. (2) I/O number designation is overlapping. (3) Numbers of the parameter and loaded AJ71QE71 are different. (4) Ethernet (parameter + dedicated instruction) is set to more than 5. | <ul style="list-style-type: none"> Write after correcting network parameters. If the error persists after corrections have been made, contact your nearest Mitsubishi representative. | QnA |
| | 3104 | (1) Ethernet and MELSECNET/10 use the same network number. (2) Network number, station number or group number set by the parameter is out of range. (3) The I/O No. is specified for the used CPU module. (4) The Ethernet-specific parameter setting is not normal. | <ul style="list-style-type: none"> Write after correcting network parameters. If the error persists after corrections have been made, contact your nearest Mitsubishi representative. | ○ Rem |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) * 1 | Error Messages | Common Information (SD5 to 15) * 1 | Individual Information (SD16 to 26) * 1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|-------------------------|------------------------|--|---|------------|---------|---------------------------------|--|--|
| | | | | RUN | ERROR | | | |
| 3105 | LINK PARA. ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |
| 3106 | LINK PARA. ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | When an END instruction is executed. | |
| | LINK PARA. ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |
| 3107 | LINK PARA. ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |
| 3200 | SFC PARA. ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | STOP → RUN | |
| 3201 | | | | | | | | |
| 3202 | | | | | | | | |
| 3203 | | | | | | | | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|-------------------------|--|--|-------------------------------|
| | 3105 | In a multiple CPU system, the Q series CC-Link module under control of another station is specified as the head I/O number of the CC-Link setting parameter. | <ul style="list-style-type: none"> Delete the CC-Link setting parameter of the Q series CC-Link module under control of another station. Change the setting to the head I/O number of the Q series CC-Link module under control of the host station. | QCPU function Ver. B or later |
| | | (1) Though the number of CC-Link module set in the network parameters is one or more, the actually mounted number of units is zero. (2) The head I/O number in the common parameters is different from that of the actually mounted module. (3) The station class for the CC-Link module quantity set parameters is different from that of the actually mounted station. | <ul style="list-style-type: none"> Write after correcting network parameters. If the error persists after corrections have been made, contact your nearest Mitsubishi representative. | ○ Rem |
| | | The contents of the Ethernet parameter are incorrect. | Write after correcting parameters. | QnA |
| | | | | |
| | 3106 | The CC-Link link refresh range exceeded the file register capacity. | Change the file register file for the one refresh-enabled in the whole range. | QCPU function Ver. B or later |
| | | The network refresh parameter for CC-Link is out of range. | Check the parameter setting. | QCPU Rem |
| | 3107 | The contents of the CC-Link parameter are incorrect. | Check the parameter setting. | ○ Rem |
| | 3200 | The parameter setting is illegal. (1) Though Block 0 was set to "Automatic start" in the SFC setting of the PLC parameter dialog box, Block 0 does not exist. | Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | ○ |
| | 3201 | The block parameter setting is illegal. | | |
| | 3202 | The number of step relays designated in the parameters is less than the number used by the program. | | |
| | 3203 | The execution type set for an SFC program in the parameters is other than the scan execution type. | | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) * 1 | Error Messages | Common Information (SD5 to 15) * 1 | Individual Information (SD16 to 26) * 1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|-------------------------|--------------------------|--|---|------------|---------|---------------------------------|--|--|
| | | | | RUN | ERROR | | | |
| 3300 | SP. PARA. ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |
| 3301 | | | | | | | When an END instruction is executed. | |
| | | | | | | | At power ON/Reset/ STOP → RUN | |
| 3302 | SP. PARA. ERROR | File name/drive name | Parameter number | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |
| 3303 | | | | | | | | |
| 3400 | REMOTE PASS. ERROR | ———— | ———— | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |
| 3401 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|-------------------------|---|--|-------------------------------|
| | 3300 | The head I/O number in the intelligent function module parameter set on GX Configurator differs from the actual I/O number. | Check the parameter setting. | QCPU Rem |
| | 3301 | The refresh setting of the intelligent function module exceeded the file register capacity. | Change the file register file for the one which allows refresh in the whole range. | QCPU function Ver. B or later |
| | | The intelligent function module's refresh parameter setting is outside the available range. | Check the parameter setting. | QCPU Rem |
| | 3302 | The intelligent function module's refresh parameter are abnormal. | Check the parameter setting. | QCPU |
| | 3303 | In a multiple CPU system, automatic refresh setting or similar parameter setting was made to the intelligent function module under control of another station. | <ul style="list-style-type: none"> • Delete the automatic refresh setting or similar parameter setting of the intelligent function module under control of another CPU. • Change the setting to the automatic refresh setting or similar parameter setting of the intelligent function module under control of the host CPU. | QCPU function Ver. B or later |
| | 3400 | The head I/O number of the target module in the remote password file is set to other than 0H to 0FF0H. | Change the head I/O number of the target module to within the 0H to 0FF0H range. | |
| | 3401 | Position specified as the head I/O number of the remote password file is incorrect due to one of the following reasons: (1) Module is not loaded. (2) Other than a Q-compatible intelligent function module (I/O, A, QnA module) (3) Intelligent function module other than the Q series serial communication module, modem interface module or Ethernet module (4) Q series serial communication module or Ethernet module of function version A | Mount the Q series serial communication module, modem interface module or Ethernet module of function version B in the position specified in the head I/O No. of the remote password file. | |
| | | The Q series serial communication module, modem interface module or Ethernet module of function version B controlled by another CPU was specified in a multiple CPU system. | <ul style="list-style-type: none"> • Change it for the Ethernet module of function version B connected by the host CPU. • Delete the remote password setting. | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15)*1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|-------------------------|--|--|------------|---------|---------------------------------|--|--|
| | | | | RUN | ERROR | | | |
| 4000 | INSTRCT CODE ERR. | Program error location | ———— | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |
| 4001 | | | | | | | | |
| 4002 | | | | | | | | |
| 4003 | | | | | | | | |
| 4004 | | | | | | | | |
| 4010 | MISSING END INS. | Program error location | ———— | Off | Flicker | Stop | At power ON/Reset/ STOP → RUN | |
| 4020 | CAN'T SET (P) | Program error location | ———— | Off | Flicker | Stop | | |
| 4021 | | | | | | | | |
| 4030 | CAN'T SET (I) | Program error location | ———— | Off | Flicker | Stop | | |
| 4100 | OPERATI ON ERROR | Program error location | ———— | Off | Flicker | Stop/ continue *2 | When instruction is executed | |
| 4101 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

*2 The CPU operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|-------------------------|---|--|-------------------|
| | 4000 | (1) The program contains an instruction code that cannot be decoded. (2) An unusable instruction is included in the program. | Read the common information of the error using a peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | ○ |
| | 4001 | The program contains a dedicated instruction for SFC although it is not an SFC program. | | |
| | 4002 | (1) The extension instruction designated by the program has an incorrect instruction name. (2) The extension instruction specified in the program cannot be executed by the specified module. | | ○ Rem |
| | 4003 | The extension instruction designated by the program has an incorrect number of devices. | | |
| | 4004 | The extension instruction designated by the program a device which cannot be used. | | |
| | 4010 | There is no END (FEND) instruction in the program. | | ○ |
| | 4020 | The total number of internal file pointers used by the program exceeds the number of internal file pointers set in the parameters. | | |
| | 4021 | The common pointer numbers used by individual files overlap. | | |
| | 4030 | The allocation pointer numbers used by individual files are overlap. | | |
| | 4100 | The instruction cannot process the contained data. | Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | ○ Rem |
| | 4101 | (1) The designated device number for data processed by the instruction exceeds the usable range. (2) Alternatively, the stored data or constants for the devices designated by the instruction exceeds the usable range. | | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) * 1 | Error Messages | Common Information (SD5 to 15) * 1 | Individual Information (SD16 to 26) * 1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|-------------------------|--------------------|--|---|------------|---------|---------------------------------|------------------------------------|--|
| | | | | RUN | ERROR | | | |
| 4102 | OPERATION ERROR | Program error location | ———— | Off | Flicker | Stop/ continue * 2 | When instruction is executed | |
| 4103 | | | | | | | | |
| 4104 | | | | | | | | |
| 4107 | | | | | | | | |
| 4108 | | | | | | | | |
| 4109 | | | | | | | | |
| 4200 | FOR NEXT ERROR | Program error location | ———— | Off | Flicker | Stop | When instruction is executed | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

* 2 The CPU operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

| | Error Code (SD0) *1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|------------------------|--|--|--------------------------------|
| | 4102 | In a multiple CPU system, the link direct device (J□¥G□) was specified for the network module under control of another station. | (1) Delete from the program the link direct device which specifies the network module under control of another CPU. (2) Using the link direct device, specify the network module under control of the host CPU. | QCPU function Ver. B or later |
| | | The network number and station number designated with a dedicated network instruction are not correct. The link direct device (J □ ¥W □) is not set correctly. • The module No./network No./character string count specified by the extension instruction is outside the setting range. • The character string (" ") specified by the extension instruction is unusable. | Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | ○ Rem |
| | | 4103 The configuration of the PID dedicated instruction is incorrect. | | ○ |
| | 4104 | The number of settings is beyond the range. | Read the common information of the error using peripheral device, and check and correct the program corresponding to that value (program error location). | Q4AR |
| | 4107 | 33 or more multiple CPU dedicated instructions were executed from one CPU module. | Using the multiple CPU dedicated instruction completion bit, provide interlocks to prevent one CPU module from executing 32 or more multiple CPU dedicated instructions. | QCPU function Ver. B or later |
| | | Numbers of execution to the CC-Link instruction are beyond 32. | Set the numbers of execution to the CC-Link instruction to 32 or less. | QnA |
| | 4108 | The CC-Link parameter is not set when the CC-Link instruction is executed. | Execute the CC-Link instruction after setting the CC-Link parameter. | |
| | 4109 | With high speed interrupt setting execute PR/PRC,UDCNT1, UDCONT2, PLSY, PWM,SPD,PLOADP,PUNLOADP,PAW PP instruction. | Delete the high-speed interrupt parameter setting. When using high-speed interrupt, delete the PR, PRC, UDCNT1, UDCNT2, PLSY, PWM, SPD, PLOAD, PUNLOAD and PSWAP instructions. | QCPU serial No. 04012 or later |
| | 4200 | No NEXT instruction was executed following the execution of a FOR instruction. | Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | ○ |
| | | Alternatively, there are fewer NEXT instructions than FOR instructions. | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|-------------------------|--------------------------------------|--|------------|----------------|---------------------------------|------------------------------------|--|
| | | | | RUN | ERROR | | | |
| 4201 | FOR NEXT ERROR | Program error location | ——— | Off | Flicker | Stop | When instruction is executed | |
| 4202 | | | | | | | | |
| 4203 | | | | | | | | |
| 4210 | CAN'T EXECUTE (P) | Program error location | ——— | Off | Flicker | Stop | When instruction is executed | |
| 4211 | | | | | | | | |
| 4212 | | | | | | | | |
| 4213 | | | | | | | | |
| 4220 | CAN'T EXECUTE (I) | Program error location | ——— | Off | Flicker | Stop | When instruction is executed | |
| 4221 | | | | | | | | |
| 4223 | | | | | | | | |
| 4230 | INST. FORMAT ERR. | Program error location | ——— | Off | Flicker | Stop | When instruction is executed | |
| 4231 | | | | | | | | |
| 4235 | | | | | | | | |
| 4300 | EXTEND INST. ERR. | Program error location | ——— | Off/On | Flicker/ On | Stop/ continue *2 | When instruction is executed | |
| 4301 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

*2 The CPU operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

| | Error Code (SD0) *1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|------------------------|--|--|-------------------|
| | 4201 | A NEXT instruction was executed although no FOR instruction has been executed. Alternatively, there are more NEXT instructions than FOR instructions. | Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | ○ |
| | 4202 | More than 16 nesting levels are programmed. | Keep nesting levels at 16 or under. | |
| | 4203 | A BREAK instruction was executed although no FOR instruction has been executed prior to that. | Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | |
| | 4210 | The CALL instruction is executed, but there is no subroutine at the specified pointer. | Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | ○ |
| | 4211 | There was no RET instruction in the executed sub-routine program. | | |
| | 4212 | The RET instruction was before the FEND instruction in the main program. | | |
| | 4213 | More than 16 nesting levels are programmed. | Keep nesting levels at 16 or under. | |
| | 4220 | Though an interrupt input occurred, the corresponding interrupt pointer does not exist. | Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | ○ |
| | 4221 | An IRET instruction does not exist in the executed interrupt program. | | |
| | 4223 | An IRET instruction exists before the FEND instruction of the main program. | | |
| | 4230 | The number of CHK and CHKEND instructions is not equal. | | |
| | 4231 | The number of IX and IXEND instructions is not equal. | | |
| | 4235 | The configuration of the check conditions for the CHK instruction is incorrect. Alternatively, a CHK instruction has been used in a low speed execution type program. | | |
| | 4300 | The designation of a MELSECNET/MINI-S3 master module control instruction was wrong. | Read the common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | QnA |
| | 4301 | The designation of an AD57/AD58 control instruction was wrong. | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|-------------------------|--------------------------------------|--|------------|----------------|---------------------------------|------------------------------------|--|
| | | | | RUN | ERROR | | | |
| 4400 | SFCP. CODE ERROR | Program error location | ——— | Off | Flicker | Stop | STOP → RUN | |
| 4410 | CAN'T SET (BL) | Program error location | ——— | Off | Flicker | Stop | STOP → RUN | |
| 4411 | | | | | | | | |
| 4420 | CAN'T SET (S) | Program error location | ——— | Off | Flicker | Stop | STOP → RUN | |
| 4421 | | | | | | | | |
| 4422 | | | | | | | | |
| 4500 | SFCP. FORMAT ERR. | Program error location | ——— | Off | Flicker | Stop | STOP → RUN | |
| 4501 | | | | | | | | |
| 4502 | | | | | | | | |
| 4503 | | | | | | | | |
| 4504 | | | | | | | | |
| 4600 | SFCP. OPE. ERROR | Program error location | ——— | Off/On | Flicker/ On | Stop/ Continue *2 | When instruction is executed | |
| 4601 | | | | | | | | |
| 4602 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

*2 The CPU operation status when an error occurs can be set at the parameters. (LED display will change accordingly.)

| | Error Code (SD0) * 1 | Error Contents and Cause | Corrective Action | Corres- ponding CPU |
|--|-------------------------|---|--|---------------------------|
| | 4400 | No SFCP or SFCPEND instruction in SFC program. | Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | ○ |
| | 4410 | The block number designated by the SFC program exceeds the range. | | |
| | 4411 | Block number designations overlap in SFC program. | | |
| | 4420 | A step number designated in an SFC program exceeds 511. | | |
| | 4421 | Total number of steps in all SFC programs exceed the range | Reduce total number of steps to below the maximum. | |
| | 4422 | Step number designations overlap in SFC program. | Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | |
| | 4500 | The numbers of BLOCK and BEND instructions in an SFC program are not equal. | Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | ○ |
| | 4501 | The configuration of the STEP* to TRAN* to TSET to SEND instructions in the SFC program is incorrect. | | |
| | 4502 | There was no STEPI* instruction in SFC program block. | | |
| | 4503 | The step designated by the TSET instruction in the SFC program does not exist. | | |
| | 4504 | The step designated by the TAND instruction in the SFC program does not exist. | | |
| | 4600 | The SFC program contains data that cannot be processed. | Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | ○ |
| | 4601 | Exceeds device range that can be designated by the SFC program. | | |
| | 4602 | The START instruction in an SFC program is proceeded by an END instruction. | | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) * 1 | Error Messages | Common Information (SD5 to 15) * 1 | Individual Information (SD16 to 26) * 1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|-------------------------|------------------------|--|---|------------|---------|---------------------------------|------------------------------------|--|
| | | | | RUN | ERROR | | | |
| 4610 | SFCP. EXE. ERROR | Program error location | ——— | On | On | Continue | STOP → RUN | |
| 4611 | | | | | | | | |
| 4620 | BLOCK EXE. ERROR | Program error location | ——— | Off | Flicker | Stop | When instruction is executed | |
| 4621 | | | | | | | | |
| 4630 | STEP EXE. ERROR | Program error location | ——— | Off | Flicker | Stop | When instruction is executed | |
| 4631 | | | | | | | | |
| 4632 | | | | | | | | |
| 4633 | | | | | | | | |
| 5000 | WDT ERROR | Time (value set) | Time (value actually measured) | Off | Flicker | Stop | Always | |
| 5001 | | | | | | | | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

| | Error Code (SD0) *1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|---------------------|---|---|-------------------|
| | 4610 | The active step information at presumptive start of an SFC program is incorrect. | Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. The program is automatically subjected to an initial start. | |
| | 4611 | Key-switch was reset during RUN when presumptive start was designated for SFC program. | | |
| | 4620 | Startup was executed at a block in the SFC program that was already started up. | Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | ○ |
| | 4621 | Startup was attempted at a block that does not exist in the SFC program. | Reset the CPU module and RUN it again. If the same error is displayed again, the intelligent function module, CPU module or base unit is faulty. Contact your nearest Mitsubishi representative. | |
| | 4630 | Startup was executed at a block in the SFC program that was already started up. | Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | ○ |
| | 4631 | Startup was attempted at a block that does not exist in an SFC program. | Reset the CPU module and RUN it again. If the same error is displayed again, the intelligent function module, CPU module or base unit is faulty. Contact your nearest Mitsubishi representative. | |
| | 4632 | There were too many simultaneous active steps in blocks that can be designated by the SFC program. | Read common information of the error using the peripheral device, check error step corresponding to its numerical value (program error location), and correct the problem. | |
| | 4633 | There were too many simultaneous active steps in all blocks that can be designated. | | |
| | 5000 | Program scan time for initial execution type programs exceeds the initial execution WDT time setting designated in the PLC RAS parameter. | Read the individual information of the error using the peripheral device, check the numerical value (time) there, and shorten scan time if necessary. | ○ |
| | 5001 | The program scan time goes over the WDT value set in the parameter PLC RAS parameter. | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|---------------------|--------------------------------------|---|------------|---------|---------------------------|------------------------------------|--|
| | | | | RUN | ERROR | | | |
| 5010 | PRG. TIME OVER | Time (value set) | Time (value actually measured) | On | On | Continue | Always | |
| 5011 | | | | | | | | |
| 6000 | PRG. VERIFY ERR. *5 | File name | ——— | Off | Flicker | Stop | Always | |
| 6010 | MODE VERIFY ERR. *5 | ——— | ——— | On | On | Continue | Always | |
| 6100 | TRK. MEMORY ERR. *3 | ——— | ——— | On | On | Continue | At power on/ Reset/STOP →RUN | |
| 6101 | | | | | | | When END instruction executed | |
| 6200 | CONTROL EXE. *4 | Cause of switch | ——— | On | Off | Continue | Always | |
| 6210 | CONTROL WAIT. *5 | Cause of switch | ——— | On | Off | Continue | Always | |
| 6220 | CAN'T EXE CHANGE *4 | Cause of switch | ——— | On | On | Continue | At switching request | |
| 6221 | | | | | | | | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

*3 Can only be detected in a redundant system. Can be detected either in the control system or the standby system.

*4 Can only be detected in the control system of a redundant system.

*5 Can only be detected in the standby system of a redundant system.

| | Error Code (SD0) *1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|---------------------|---|---|-------------------|
| | 5010 | (1) The scan time of the program exceeded the constant scan setting time specified in the PLC RAS setting parameter. (2) The low speed program execution time specified in the PC RAS setting parameter exceeded the margin time of constant scan. | <ul style="list-style-type: none"> Review the constant scan setting time. Review the constant scan time and low speed program execution time in the parameter so that the margin time of constant scan may be fully reserved. | ○ |
| | 5011 | Low speed execution type program scan time goes over the low speed execution WDT set in the parameter PLC RAS settings. | Read the individual information of the error using the peripheral device, check the numerical value (time) there, and shorten scan time if necessary. | |
| | 6000 | The control system and standby system in the redundant system do not have the same programs and parameters. | Synchronise the programs and parameters of the control system and standby system. | Q4AR |
| | 6010 | The operational status of the control system and standby system in the redundant system is not the same. | Synchronise the operation statuses of the control system and standby system. | |
| | 6100 | A CPU module tracking memory error was detected during initial. | Because this is a CPU module hardware error, contact your nearest Mitsubishi representative. To replace the module, replace the standby system CPU first, then the control system CPU. | Q4AR |
| | 6101 | The CPU module detected an error during the handshake for tracking. | Check the condition of the other stations. | |
| | 6200 | The standby system in a redundant system is switched to the control system. | Check the control system condition. | Q4AR |
| | 6210 | The control system in a redundant system is switched to the standby system. | Check the control system condition. | |
| | 6220 | (1) Because the standby system is in an error or the like with a redundant system, the control system does not switch to the standby system. (2) Failure to switch to the standby system due to a network error or the like of the control system | Check the standby system condition. | |
| | 6221 | Switching is disabled because of a bus switching module error. | Because this is a bus switching module hardware error, contact your nearest Mitsubishi representative. | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) * 1 | Error Messages | Common Information (SD5 to 15) * 1 | Individual Information (SD16 to 26) * 1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|-------------------------|-------------------|--|---|------------|---------|---------------------------------|----------------------|--|
| | | | | RUN | ERROR | | | |
| 6230 | DUAL SYS ERROR | ——— | ——— | On | On | Continue | Always | |
| 7000 | MULT CPU DOWN | Unit No. | ——— | Off | Flicker | Stop | Always | |
| | | | | | | | At power ON/Reset | |
| 7002 | | | | | | | At power ON/Reset | |
| 7003 | | | | | | | | |

* 1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

* 4 Can only be detected in the control system of a redundant system.

| | Error Code (SD0) *1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|---------------------|--|--|-------------------------------|
| | 6230 | The link module mounted on the standby type CPU is the remote master station. | Check the system configuration status. | Q4AR |
| | 7000 | (1) In a multiple CPU system, at CPU module fault occurred at a station where "All station stop by stop error of PLC " was selected in the operating mode. (2) High Performance model QCPU of function version A was loaded in a multiple CPU system. | (1) Read the individual information of the error using the peripheral device, check the error of the PLC resulting in CPU module fault, and remove the error. (2) Remove the High Performance model QCPU of function version A from the main base unit. | QCPU function Ver. B or later |
| | | In a multiple CPU system, station 1 resulted in stop error at power-on and the other stations cannot start. (This error occurred at stations 2 to 4) | Read the individual information of the error using the peripheral device, check the error of the CPU module resulting in CPU module fault, and remove the error. | |
| | 7002 | (1) There is no response from the target CPU module in a multiple CPU system at initial communication stage. (2) High Performance model QCPU of function version A was loaded in a multiple CPU system configuration. | (1) Reset the High Performance model QCPU and run it again. If the same error is displayed again, it is a hardware fault of any CPU module. Consult your sales representative. (2) Remove the High Performance model QCPU of function version A from the main base unit. Alternatively, replace the High Performance model QCPU of function version A with the High Performance model QCPU of function version B. | |
| | 7003 | There is no response from the target CPU module in a multiple CPU system at initial communication stage. | Reset the High Performance model QCPU and run it again. If the same error is displayed again, it is a hardware fault of any CPU module. Consult your sales representative. | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

Error Code List (Continued)

| Error Code (SD0) *1 | Error Messages | Common Information (SD5 to 15) *1 | Individual Information (SD16 to 26) *1 | LED Status | | Operating Statuses of CPU | Diagnostic Timing | |
|------------------------|----------------------------------|--------------------------------------|---|-------------|---------|---------------------------|------------------------------|--|
| | | | | RUN | ERROR | | | |
| 7010 | MULTI EXE. ERROR | Unit No. | ———— | Off | Flicker | Stop | At power ON/Reset | |
| 7020 | MULTI CPU ERROR | Unit/module No. | ———— | On | On | Continue | Always | |
| 9000 | F * * * * *6 | Program error location | Annunciator number | On | Off | Continue | When instruction is executed | |
| | | | | USER LED On | | | | |
| 9010 | <CHK> ERR * * * - * * * *7 | Program error location | Failure No. | On | Off | Continue | When instruction is executed | |
| | | | | USER LED On | | | | |
| 9020 | BOOT OK | ———— | ———— | Off | Flicker | Stop | At power ON/Reset | |
| 10000 | CONT. UNIT ERROR | ———— | ———— | Off | Flicker | Continue | Always | |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

*6 * * * * indicates detected annunciator number.

*7 * * * indicates detected contact and coil number.

| | Error Code (SD0) *1 | Error Contents and Cause | Corrective Action | Corresponding CPU |
|--|---------------------|--|---|-------------------------------|
| | 7010 | (1) Faulty CPU is loaded in a multiple CPU system. (2) High Performance model QCPU of function version A is loaded in a multiple CPU system configuration. (An error is detected at the High Performance model QCPU of function version B.) (3) In a multiple CPU system, any of CPU No. 2 to 4 was reset during power-on. (This error occurs at only the CPU module which was reset.) | (1) Read the individual information of the error using the peripheral device, and change the faulty station. (2) Change the station of function version A for function version B. (3) Do not reset the CPU modules of CPU No.2 to 4. Reset the High Performance model QCPU of CPU No.1 and restart the multiple CPU system. | QCPU function Ver. B or later |
| | 7020 | In a multiple PLC system, a PLC fault occurred at a CPU module where "All station stop by stop error of PLC" was not selected in the operation mode. (The error is detected at the CPU module of other than the station where the CPU fault occurred.) | Read the individual information of the error using the peripheral device, check the error of the CPU module resulting in CPU module fault, and remove the error. | |
| | 9000 | Annunciator (F) was set ON | Read the individual information of the error using the peripheral device, and check the program corresponding to the numerical value (annunciator number). | ○ |
| | 9010 | Error detected by the CHK instruction. | Read the individual information of the error using the peripheral device, and check the program corresponding to the numerical value (error number) there. | |
| | 9020 | Storage of data onto ROM was completed normally in automatic write to standard ROM. (BOOT LED also flickers.) | Set the parameter enable drive to standard ROM, switch power on again, and perform boot operation from standard ROM. | QCPU function Ver. B or later |
| | 10000 | In the multiple CPU system, an error occurred in the CPU module other than the Process CPU/High Performance model QCPU. | Use the software package of the corresponding CPU module to check the details of the error that occurred. | QCPU function Ver. B or later |

*1 Characters in parentheses () indicate the special register numbers where individual information is being stored.

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